American Aviation

The Independent Voice of American Aeronautics

MAY 15, 1945

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World Collaboration

THE AIRLINE OPERATORS of the world have made an auspicious start toward postwar collaboration. The new International Air Transport Association formally launched April 19 at Havana, Cuba, should have a long life of usefulness in the interest of international air transportation.

Fortnightly Review

If the spirit which pervaded the Havana air transport conference can be maintained, the I. A. T. A. will have accomplished for a world transportation medium a means of cooperation and self-determination which no other industry or form of transport has ever achieved in history.

The association is much more than a world trade organization. It isn't a cartel and it isn't an instrumentality with which to suppress the free development of air transport for the benefit of the peoples of the world. It is, however, a means of providing the machinery by which differences and problems can be amicably resolved, and by which much governmental interference and controls can be avoided.

The aims and objects of the association are broad and noteworthy for their simplicity. They are to promote safe, regular, and economical air transport for the peoples of the world, to foster air commerce . . . to provide means for collaboration among the air transport enterprises engaged in international air transport service . . . and to cooperate with the International Civil Aviation Organization being established by the governments of the world. Certainly all forward-thinking operators can agree on these clear-cut aims.

The final results at Havana were not pleasing to everyone. It could hardly

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President of AMEX

Sumner Sewall, former governor of Maine, has been elected president and a director of American Export Airlines.

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Late Bulletins

Babcock Convair Chairman

Irving B. Babcock, president of the Aviation Corp., has been elected chairman of the board of directors of Consolidated-Vultee Aircraft Corp., succeeding Tom M. Girdler who resigned recently. Babcock joined Aviation Corp., which owns a large interest in Convair, Feb. 1.

Air Power Survey

Twelve air delegates to the Inter-American Defense Board, accompanied by U. S. Army and Navy technicians, left Washington May 14 to survey the military aviation facilities throughout the western hemisphere. It is the first survey of its kind.

Trend of The News

Radio Outlook Brightens: The aviation industry is encouraged by the War Production Board's disclosure of its plan for permitting production of radio equipment for commercial aircraft in the not too distant future. When military orders for radio and radar equipment fall below 90 percent of the average monthly delivery rate for the first quarter of 1945, WPB Limitation Order L-265 will be revised to permit unrestricted production of components, including tubes for replacement purposes and all electronic and equipment except broadcast, receiving and reproducing equipment for entertainment purposes. Some estimate this will be within three or four months. Availability of radio equipment for converted surplus planes by airlines has been difficult and slow. WPB's plan calls for revocation of L-265 when military requirements fall below 75 percent of the delivery rate for the first quarter of 1945 with a simplified priority system to assure preference of military orders over civilian deliveries.

Pilotless Planes: Crashing into the Shrine Auditorium, one of the largest civic buildings in Los Angeles, a radio-controlled Navy plane recently revealed extensive experimental work and caused a partial lifting of strict censorship on development of pilotless aircraft. For some time knowledge of such work has circulated in the industry. One company engaged in building this type of craft never has been permitted to disclose the nature of its wartime assignment, although its product is a familiar sight at several West Coast Navy fields. The seizing of control of these planes by the enemy always has created a problem in experimentation toward utilizing them in combat areas.

Bendix Lightplane?: A report that Bendix Aviation Corp. is considering entering the lightplane field was called premature recently by a company spokesman, who said "you don't talk about things until you have something to talk about, and Bendix has no lightplane at present." He pointed out, however, that Bendix is in the aircraft components business, and that building low cost starters, radios, automatic pilots, instruments and other equipment is essential if the flying public is to get a good low cost lightplane.

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25c

Ridin' Herd by Helicopter

Many of America's larger Western cattle ranches cover thousands of acres . . . with good grazing land separated by stretches of rough, rocky, arid terrain. Into such areas, calves and cattle frequently stray and are lost, representing a total loss in annual beef production of many thousands of pounds.

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In addition, it can be invaluable when used for frequent checkups on all-important water facilities, carrying supplies to mend windmills, pipes, etc. Fence patrol and mending too, are vital functions for which the helicopter is ideally suited.

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American Aviation

The Independent Voice of American Aeronautics

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BUY MORE WAR BONDS

Trends

(Continued from page 1)

New Planes Essential: Near the top of the War Production Board's list of V-E Day removal of controls over industry was production order No. L-48 which prohibited the manufacture of planes for civilian use. Manufacturers, however, do not feel that removal of L-48 is the complete answer to their needs since WPB is committed to a policy of priorities on scarce materials and components, channeling them first to the producers of essential consumer goods.

As a result, aircraft manufacturers wanted outright revocation of L-48 without amendments and also wanted some assurance of priorities in obtaining materials. There was little to indicate that WPB would look upon aircraft for civilians as belonging in the "essential classification." Therefore, bottlenecks in any quick resumption of private plane production appeared inevitable.

War Manpower controls will continue indefinitely, and some firms will find themselves in critical areas where they cannot hire employes—although many workers would like to shift from strictly war plants.

First revocations of controls applicable to the aviation industry were minor— merely lifting controls over aircraft lighting equipment, airport lighting equipment and aircraft control and pulley bearings. Very few of the other stumbling blocks will be cleared up within the next 30 days.

Last Schools to Close: Termination of the last nine of the Army contract pilot training schools is scheduled for August 2. Others of the 66 schools operated by private contractors for the Army Air Forces have been closed on a tapering-off schedule. Owners of the nine remaining schools have been notified of the closing date, and they in turn have advised their employes. The four British pilot training schools operated by private contract in the United States are continuing.

Air Travel Hotels: The building of several new hotels and the remodeling of others in key airline cities of South America bids well for the expansion of air transportation in that direction. A chain of state-sponsored hotels have been built in Peru and are being managed by private interests. A modern hotel was recently completed in Panama City, according to Christopher de Groot, general traffic manager of Panagra, who has returned from a South American tour. In Quito, Ecuador, plans are under way for a new hotel, while in Chile, notably at Puyehue and Tejas Verdes, several new resort hotels have been completed. A new hotel also has been built at Corumba, Brazil, where cross-continent air service from Rio connects with routes serving Bolivia and the west coast.

Engine Outlook: Forthcoming cutbacks on aircraft engine production may actually increase the schedules of regular engine manufacturers. The reason is that auto companies claim they are left with too small a quantity for efficient production and want to either get bigger orders or get out completely. The latter alternative would mean that aircraft manufacturers would have to take on their remaining contracts.

Clipper Girls: Cracking the last male citadel at Pan American Airways, Madeline Cuniff of New York, native of Birmingham, Ala., recently boarded a Clipper for her first trip as a stewardess, the first time women have flown in a Clipper flight crew in the six-year history of PAA's transatlantic air service. The first four Clipper stewardesses will fly first to Bermuda and later this summer all the way across the ocean to Foynes, Eire.

Surplus Plane Change: There have been numerous indications that authority for the disposal of surplus planes may be transferred from the Reconstruction Finance Corp. to the Department of Commerce, as a result of dissatisfaction which has been growing since the sales program was inaugurated.

One high Government official said that authorization for the transfer is already "on paper", but the change was being resisted strongly in several quarters.

Roscoe Turner, who as president of the National Aviation Trades Association is one of the most ardent spokesmen, spent some time in Washington last fortnight urging the transfer upon Government officials.

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The brightest page in the epic of war is being written by the swift flight of huge mercy ships of the air . . . bringing wounded American boys back to medical care. From the most remote battle front back to base hospital or to the homeland is a matter of a few hours . . . or a day. Thousands who would have died are being delivered . . . back to their families and loved ones, to live out their days. Along with penicillin, plasma and the sulfa drugs, the airplane is the great lifesaver of this war. Douglas workers, builders of planes for the world's airlines yesterday and tomorrow, cherish their privilege today of building wings of deliverance for those to whom we all owe so much.

Douglas

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FIRST AROUND THE WORLD — FIRST THE WORLD OVER

Phillips

Excerpt from the Report of the Special Sub-Committee on Petroleum Investigation, of the House of Representatives

January 2, 1945

"The United States has achieved the almost impossible by stepping up its daily production (of 100-octane fuel) from 45,000 barrels in December 1941 to more than 500,000 barrels. In the meantime, a remarkable improvement has been accomplished in the quality of the 100-octane product."

Phillips
AVIATION GASOLINE

(Continued from page 1)

be expected that they would be. There are government airlines and private airlines and there is a maze of uncertain political, geographical and economic complications arising from the current world situation. The maneuvering for position in the all-important nine-man executive committee was bound to create some disfavor, for obviously not every operator or every country could be represented.

But it was heartening that I. A. T. A. survived this first test of strength and stability, for those who were not satisfied or who had failed to achieve the recognition which they thought they deserved, submitted to the will of the majority. No one underestimates the task of holding the organization together during the first few years of its existence but the first test was perhaps as good an omen as one could find.

A more desirable geographical representation on the executive committee might have been found than the compromise one adopted, but there were considerations at this time which prevented a better spread of representation. Perhaps at the Montreal meeting in October the committee will be more geographically perfect. But even so, one can only make observations of minor importance. There is nothing fundamentally wrong with the committee as it now stands. It is ability, not geography, that should dictate the membership selection.

The presence on the committee of experienced and respected transport men like Hudson Fysh of Qantas Empire Airways in Australia; Albert Plesman, the veteran Dutchman who has been at the helm of KLM since its inception; of Per A. Norlin of the Swedish international airline; and Rene Briand of Air France, testifies to the strength of the organization. On our own side the two U. S. representatives, John C. Cooper, vice president of Pan American, and John E. Slater, vice president of American Export Airlines, are capable and logical selections. Both men deserve much credit for the untiring work they performed on the drafting and steering committees.

The selection of Herbert J. Symington, president of Trans-Canada Air Lines, as the president of the association was a fine tribute to the able Canadian. As at the Chicago international aviation conference, Symington again proved his towering and mature stature at Havana. His seasoned statesmanship provided the outstanding single leadership of the conference. As on many other occasions, Canada has contributed to the world an impartial leader who commands respect and can provide a sure solution to an impasse. To Mr. Symington must go no small part of the credit for launching the new organization successfully.

The need for the association should be apparent to anyone who has been concerned with international air transportation. Collaboration, harmony, and cooperation among the airlines of the world is a worthy goal—and virtually essential if air transport is to develop properly in the public interest. But the problems are many. There are differences in philosophies, approaches, and concepts. It isn't necessary, desirable, or even possible, to resolve all of these differences in order to have a successful organization. What is desired is an international machinery by which all operators can solve mutual problems to the greatest extent possible, and to permit air transport to serve the peoples of all countries.

The I. A. T. A. is off to a good start. By the time the first annual meeting is held this fall in Montreal a great many changes in the world will have taken place and the organization can buckle down to work. By then both the British and the U. S. foreign air policies will have been crystallized and better balances of power within the organization can be attained. The era of real volume international air transport is now getting underway.

The Dollar Problem

JUST what the postwar international monetary situation will look like is anyone's guess at the moment, but the fundamentals of exchange will remain regardless of what happens.

Other countries cannot purchase airplanes in the United States unless they have dollars. And it stands to reason that the world will be short of dollars within a brief time after rehabilitation begins. Not many countries have much dollar exchange even now.

The hopes of U. S. manufacturers in selling the foreign market will be dashed unless a realistic approach is made in terms of world monetary problems. The market is limited if foreign customers must always pay dollars for equipment; it is quite broad if they can be aided in their purchases in terms of employment in their own countries and their own currencies.

Any efficient U. S. manufacturer will argue that he can build 300 transport planes more inexpensively than he can build 40. It is the essence of American productive genius that production be concentrated in one vast operation. But if the prospective foreign customers can't obtain the necessary dollar exchange, the benefits of efficient large-scale production are meaningless.

Foreign customer A may want U. S. transports. On a strictly price basis, these transports can be purchased most cheaply in the U. S. But customer A has no dollar exchange. He would like to build U. S. transports in his own country. The unit cost may be far higher in terms of *price*, but the actual *cost* in country A is purely relative, for construction there means employment and business within its own territorial or financial limits.

U. S. manufacturers might well ponder the necessity of sponsoring assembly plants, or selling design rights, to other countries. If the U. S. is to participate in international trade it must think and act in international terms. And this means abandoning the idea that everyone in the world must find dollar exchange to purchase products here. It isn't a question of price—it's a question of dollar exchange.

Critics who might say that to build U. S. airplanes in other countries deprives employment in this country are begging the question. It is simply a question of whether we want U. S. airplanes used around the world, and aid in getting them built, or retain our

restricted market by sitting at home and waiting for those customers to come to us who can find the necessary dollars. Right now the rush is to the U. S., but in the long run this market will largely disappear. For other countries must develop their own industries. Will they develop with U. S., British, French or some other type of airplane? We think it should be U. S. airplanes—but it won't be until the U. S. industry attains the international approach.

Building Morale in the Field

ON MAY 18, W. A. Patterson, president of United Air Lines, begins one of the most unusual tours ever made by any airline executive. He will start a 42-day trip over the company's coast-to-coast system to visit every single station and to meet at least a majority of the company's 8,000 employes.

We can think of no more salutary activity of an airline executive than to devote personal time to field inspection. Mr. Patterson's trip is bound to pay high dividends in morale and efficiency. The airline business before the war was highly personalized. Through circumstances caused entirely by the war the industry has tended toward an impersonalization in which employee-executive contact has become the exception rather than the rule.

We hope Mr. Patterson's system-wide trip is the start of a get-acquainted period for the entire industry in which the high morale which characterized the airlines before the war can be regained. No one doubts that Mr. Patterson has more than enough to occupy his time at his Chicago offices. That he has chosen to go into the field despite the pressure of work at the main office is to his credit as a forward-thinking executive.

WAYNE W. PARRISH.

Trends

(Continued from page 6)

Veterans' Preference: Gen. Lewis B. Hershey intends to stick by his guns on re-employment of veterans despite the fact that in some aircraft companies the number of former employes in military service is double the expected peacetime employe total. He says that it would require an amendment to the Selective Service Act to do otherwise, and there isn't time for the enactment of such an amendment. The explanation of the trouble is that Congress thought the Act was for a year's defense training and that turnover would take care of returnees. Then came the war and continued military service requirements. Aircraft manufacturers see this as a major problem, and regard it as one of their biggest public relations jobs.

Military Research: Advocates of a major program for continuation of scientific research and development in the aviation industry after the war may have an important ally in Rep. Clifton A. Woodrum (D., Va.), chairman of the House Postwar Military Policy Committee. In setting a hearing for June 4 on compulsory peacetime military training, Woodrum filed a report with the house recommending that military scientific research be continued after the war. He said that such research, now conducted under executive order, would be discontinued when the war ends unless Congress provides an agency and funds for the work.

Two-Cycle Engine: A well known auto manufacturer has perfected a two-cycle aircraft engine that may prove the answer to lightplane power plant requirements. No details as to horsepower or number of cylinders are yet available.

Count on Renegotiation: The German collapse had no noticeable effect on the bill to extend the life of the Renegotiation Act from June 30 to Dec. 31, 1945, which has been before the House Ways and Means Committee. The legislation is expected to meet little opposition in the House, and will probably move swiftly through the Senate Finance Committee.

CAR Proposals by June 1: The CAA hopes to have its recommendations for revisions to Parts 03 and 04 of the Civil Air Regulations in final form and ready for submission to the CAB on or before June 1. Part 04 deals with plane airworthiness for the transport category, while Part 03 is a new designation covering plane airworthiness for other than transport category. This was formerly included in Part 04.

No Requirements?: Some suggestions are being offered that the CAA eliminate airworthiness requirements for lightplanes and substitute merely tests which would reveal load factors, rates of climb and similar characteristics. The rest would then be up to the purchaser, whom it would be assumed would know enough about these things to know whether the planes were safe. The argument is that prices could be lowered. It's doubtful, however, that such proposals will receive serious consideration.

Letters

Agrees It's a 'Mess'

Dallas, Texas
April 17, 1945

To the Editor:

Have been reading *American Aviation* for some years and I want to strongly endorse the sentiments you have expressed in your editorial "The Surplus Airplane Mess" in the April 15th issue.

From personal experience, I want to point out that I have been planning to buy a surplus plane in the 175 hp. class, but after looking at the price tags that have been hung on these planes and knowing what has to be done to get them certificated by the CAA, it is a financial impossibility. You can multiply my case by the hundreds.

I have a friend who runs a fair sized aircraft repair station here and he figured that if he could buy ten PT-13s at a price below the price tag figures, he could do the work necessary to get them certificated and would be able to offer them to the public at reasonable cost. He tried to get DPC (RFC) to sell him 10 at below price tag figures, but they turned him down.

As I see it, the price tag policy makes it impossible for the buyer of either a single plane or of several planes to assure himself of not losing money. Few planes will be sold under these conditions and, certainly, aviation will be retarded. By contrast, as we have seen, the system of competitive bids for surplus aircraft enabled the government to dispose of these planes, because buyers had the prospect of at least breaking even on their investments.

JAMES L. CAMP.

Books

AVIATION RADIO. By Henry W. Roberts. 637 pp. $5. William Morrow & Co., New York.

This book presents in a single volume the complete story of aviation radio, including a fully detailed and illustrated discussion of its fundamental principles, primary and advanced radio facilities, radio navigation, and the design and installation of radio equipment, presented in language designed to bring it within the comprehension of the layman. The author, Henry W. Roberts, is a recognized expert on the subject, who in 1940 received the Harmon Medal for his literary contributions to the science of aeronautics and radio communications.

While the book is to be commended for its completeness and the way in which it simplifies a highly complex subject, there is a tendency at some points to bring in theoretical matter, which while of interest to the radio engineer, might prove confusing

Tomorrow . . . the high road

With peace, many of you who have not flown lately will be able to take to the air again. Then you'll discover that the Age of Flight is *here* . . . Picture yourself aboard a spacious sky giant with luxurious accommodations for fifty passengers. That will be your new 4-engine United Mainliner—already ordered.

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This is your "high" way of tomorrow—the famous Main Line Airway coast to coast—short, colorful route straight through the heart of the nation. Whether pleasure bent or on a business trip, you'll find within hours' and minutes' reach the country's largest cities . . . leading recreational centers . . . thriving business areas.

The Pacific and Atlantic Seaboard cities will be only 9 hours apart in the amazingly speeded-up postwar coast-to-coast flights. United is preparing now to offer this outstanding *Mainliner Service* the moment these giant 4-engine planes are available.

to the lay reader, and in other places over-simplification. This is particularly true in some of the positive statements made such as that "today most private aircraft carry at least a two-way radio transmitting and receiving apparatus." The section on instrument landings leads one to believe that glide path indicators for blind landings have reached a much higher stage of development than generally known.

Wings of Yesterday

Twenty-five Years Ago

The first inter-city flight in a dirigible B-18, on the Pacific Coast, was made non-stop from San Diego to Los Angeles and return. The 250 miles were covered in five and a half hours. (May 14, 1920).

The first annual Army Air Tournament was held at Bolling Field, and included an exhibition of aerobatics and combat flying by army pilots. (May 14-16, 1920).

The first aerial mail plane arrived in Chicago from Omaha at 6:50 p.m. The plane, piloted by D. Wald, left Omaha at 1 o'clock. Ray Benedict made the flight from Chicago to Omaha on the same day, opening the first westward extension of air mail service from Chicago. (May 15, 1920).

A Thomas-Morse S.-6 made a remarkable flight from Ithaca to Washington, to Dayton, and then back to Ithaca. In order to keep a straight course it was necessary to fly into the wind about 25 degrees. (May 15, 1920).

The maiden flight of the first commercial dirigible (Goodyear) in America was made from Commercial Airship Syndicate Field in Kansas City, Mo. (May 16, 1920).

A Curtiss "Wasp", first military machine owned by the Bolivian Government, made a successful flight from the airdrome at La Paz, 13,000 feet above sea level. (May 16, 1920).

Fifteen Years Ago

Dr. Ludwig Prandtl received the second Daniel Guggenheim medal for his work in aerodynamics. (May 9, 1930).

Jean Mermoz, accompanied by Jean d'Abry and Leopold Gimie, flew from Senegal to Natal, Brazil, establishing a distance record for seaplanes of 1,971.7310 miles. (Latecoere 28, Hispano-Suiza motored). (May 12-13, 1930).

The NACA Fifth Annual Aircraft Engineering Research Conference was held at Langley Field, Virginia, to review the work of the past year and to outline a new research program for 1931. (May 13, 1930).

The Second National Airport Conference was held at Buffalo, N. Y., under the auspices of the Aeronautical Chamber of Commerce. Committee reports were published with the minutes of the convention and distributed to municipalities, corporations and individuals concerned with the development of American airports. (May 14-16, 1930).

Technical Booklets

(Available through American Aviation Reader Service Dept., American Bldg., Washington 4, D. C.)

Pesco Products Co., 11610 Euclid Ave., Cleveland 6, Ohio, has issued a new booklet on "Aircraft Accessories for 400 Cycle Motor Operation," containing a discussion of the various applications by Ray G. Holt, Pesco sales engineer.

Towmotor Corp., Cleveland 10, Ohio, features the materials handling system at the Chance Vought Division, United Aircraft Corp., in the current issue of its house organ "Handling Materials." Copies are available on request.

Lear Inc., Piqua, Ohio, has issued an elaborate loose-leaf manual of its electro-mechanical aircraft accessories. In a profusely illustrated format, it furnishes data on standard units for design purposes. Additional pages will be issued from time to time as new models are put in production.

Equipment covered includes linear actuators, rotary actuators, power units, screw jacks, flexible shafting and accessories, motors and controls.

Goodyear Aircraft Corp., Akron, O. has put out an illustrated report booklet called "Aircraftsmanship" which includes color drawings of each type of warplane and blimp on which the company works.

Zimmer-Thompson Corp., Long Island City 1, N. Y., has issued a new descriptive booklet on Iso-Rev Constant Speed Propellers, detailing their principle of operation in text, photographs and drawings.

Zephyr Manufacturing Co., 201 Hindry Ave., Inglewood, Calif., has just issued a new catalog of aircraft tools. Tools are shown in actual-size photographs and in actual use.

Miscellaneous Booklets and Films

The AT-21 Gunner, Fairchild twin-engine training plane, is the subject of a new film produced in full color and sound by the Princeton Film Center, Princeton, N. J. Flight shots and scenes taken at Fairchild Engine and Airplane Corp. plants of the plane in construction are included. The Film Center announces the movie is now ready for distribution and urges early bookings.

To give the public an idea of how easy it is to fly, Universal Pictures has made a short movie showing how Al Bennett, sales manager of the Aeronca Aircraft Co., Middletown, Ohio, teaches children the rudiments of flying. The film is called "Wingmen of Tomorrow."

The Division of Aeronautics, Library of Congress, headed by A. F. Zahm has issued a bibliography entitled, "Aeronautics in Alaska." References dealing with the history of aviation in Alaska have been appropriately listed under subject matter by Arthur G. Renstrom and go back as far as 1913. There also is contained in the booklet an index of the authors of the several articles.

"Airplane Crash Fire Fighting Manual" is available from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

Jack & Heintz, Inc., Cleveland, has prepared a simplified manual on contract terminations, which is available to contract termination officials. The manual is designed to fit well into any type of plant or operation, and is simplified to conform with all requirements of joint terminations relations. Contract termination officials may obtain copies without charge by writing to Jack & Heintz, Inc., 502 Hanna Bldg., Cleveland 15, O.

The Civil Aeronautics Administration has released two flight engineering reports: No. 14, "Application of Transport Category Operating Rules," and No. 13, "A General Flight Test Program for the Transport Category." Copies are available from the CAA, Publications and Statistics Division, Washington 25, D. C. No. 14 is addressed primarily to the engineering staffs of air carrier operators as an outline of methods which may be employed by them for the purpose of determining the status of their operation in respect to compliance with operating rules. Report No. 13 provides an outline of a general program arranged into individual flight plans for guidance in preparing specific test programs for airplanes to be tested in the transport category.

"Missouri Skyways" is an outline for state, city and town planners and airport committees for projecting aviation facilities from airparks to major air terminals. Although specifically designed to fill the needs of airport planners in Missouri, much of the booklet is applicable to any community. Available from the Missouri State Department of Resources and Development, State Office Building, Jefferson City, Missouri.

The printed report of the U. S. Aeronautical Mission which visited Great Britain in November and December, is now available from the Aeronautical Chamber of Commerce of America, 610 Shoreham Bldg., Washington 5. The 110-page report supplements the mission's earlier informal report.

Five volumes of abstracts of mechanical, electrical and non-chemical patents seized from enemy aliens and nationals of occupied countries have been published by the Office of the Alien Property Custodian, Chicago 3. The complete set may be purchased for $25, and separate sections or classes will be supplied at proportional prices. An Index and Guide showing the prices can be obtained from the same office without charge. Licenses under most of these patents are readily obtainable by any U. S. citizen upon application and payment of a $15 per patent administrative fee. Such applications should be addressed to the Office of the Alien Property Custodian, Division of Patent Administration, Washington 25.

Obituaries

Lew Russell Palmer

Lew Russell Palmer, founder and official of the National Safety Council, died last month in New York. In recognition of his efforts in behalf of the airlines, officials of the major companies presented him with a gold watch in 1940.

Cleason E. Shealer

Cleason E. "Jack" Shealer, 49, shop superintendent at Pan American Airways' maintenance department at La Guardia Field, New York, died April 23 at his home in Bayside, L. I. He had been with PAA 15 years.

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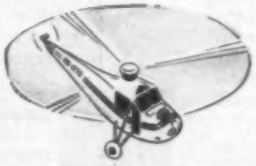

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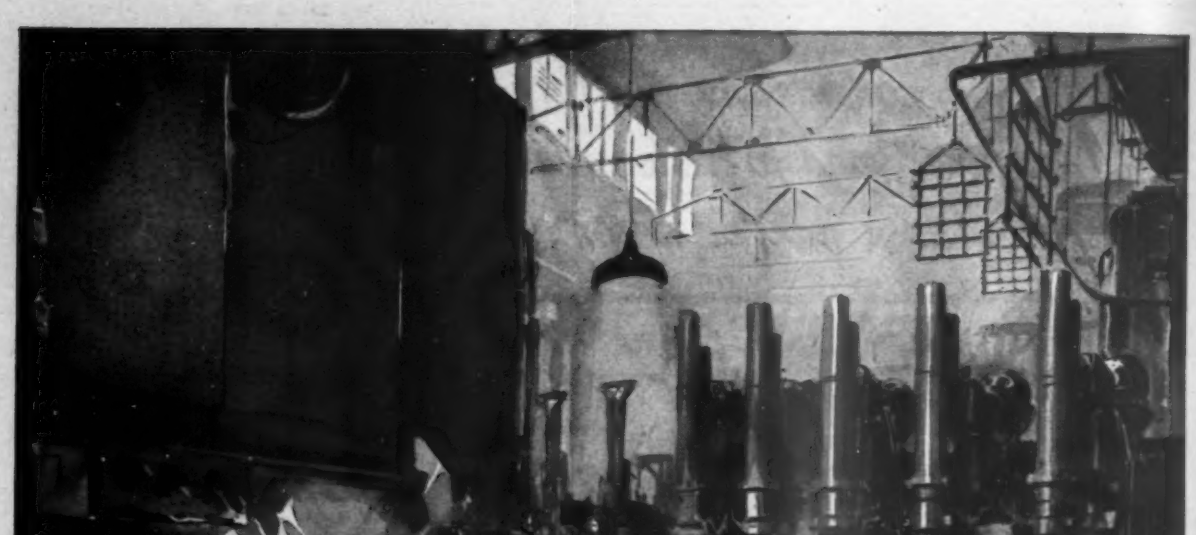

"WAR TRANSPORT IN THE MAKING" *at Mechanics Universal Joint Division in Rockford, Illinois. James Sessions paints one of many high-speed operations in the production of universal joints and drive shafts for trucks, half-tracks, tank destroyers, tanks and aircraft. This big Borg-Warner plant is one of the world's largest makers of universal joint assemblies.*

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This Issue

Aircraft Engine Picture is Far from Clear

Gas Turbine, Turbo Jet, Reciprocating Types All Will Play Big Postwar Roles

By Sydney Carter

(This is the first of three articles on the postwar aircraft power picture. The second will deal with prospects of different types of reciprocating engines, and the third with propeller developments.)

WHILE some of the more enthusiastic proponents of the gas turbine and turbo jet engine are of the opinion that these new types are destined to completely displace the reciprocating engine as a source of aircraft power, leading power plant engineers, some of whom have been working on gas turbine development for a decade or more, are inclined to the more conservative viewpoint that gas turbines, turbo jet engines and reciprocating engines will all command their own particular spheres of utility in the air transport field for many years to come.

No Boundary Line Yet

Just where the boundary line between the various spheres will be drawn, however, is a matter on which there is no general agreement. There are too many variable factors ranging all the way from how rapidly turbine development will proceed to innate characteristics of the new power plants and their relationship to the operating requirements of commercial airlines.

An excellent case in point is the propellerless turbo jet. Regardless of the extent to which improved metallurgical development succeeds in cutting down overall fuel consumption, this type of engine will reach its maximum efficiency at high speed and high altitude. On the surface, therefore, it would appear that its principal transport application would be for long range transcontinental or over-ocean operation. Here, however, one runs into the problem of fuel consumption. While new developments may and undoubtedly will reduce the fuel consumption of the jet engine, it is doubtful whether they will succeed in bringing it down to or below that of a really efficient turbo-supercharger reciprocating engine combination operating at its most economical level.

On the other hand, the turbo jet offers extremely interesting possibilities for ranges up to 400 or possibly 700 miles. Here the engine would not be operating at its maximum efficiency, but its use would be warranted by the weight savings involved. These include not only the difference in weights in the engines, but the poundage that could be saved through elimination of the propellers, shorter landing gear, and savings in airframe weight made possible by the absence of vibration in the jet engine. Up to the point where the weight of fuel consumed by the jet engine exceeded the total of these weight reductions, a definite advantage from the standpoint of payload would result.

But while the jet engine would offer a payload advantage over such ranges, it would also introduce many new operations problems. Take-off characteristics are definitely bad, and it is even possible that a jet propelled transport which took off after a normal run in Washington wouldn't be able to get off the ground in Denver, particularly on a hot day. A second major disadvantage would be the lack of fuel reserve in terms of time. If the destination airport was closed in, the jet plane couldn't circle the field for any length of time waiting its turn to land. And finally, operations would have to be held within very critical limits. For example, if Washington and Chicago were open but Columbus was closed in, the reciprocating engine powered airliner could take on a few less passengers and a little more fuel and pass up Columbus. The range of the jet, however, would be so critical that it couldn't operate unless all its scheduled stops were usable.

The line between the reciprocating engine and the gas turbine driving a propeller is even more difficult to draw. An engineer with one of the leading engine manufacturers puts it on a basis of horsepower. Up to 3,500 horsepower, he believes, the reciprocating engine will have the field all to itself. Between 3,500 and 4,500 horsepower which will prove superior is questionable. Over 4,500 horsepower the turbine should hold a definite advantage.

Another engineer for the same company, however, draws the line on a basis of speed and altitude. He sees the reciprocating engine reigning supreme up to speeds of from 300-400 miles per hour and altitudes up to 20,000-30,000 feet. Above these limits he believes the gas turbine will take over.

Jets May Control 400-700 Range

The chief engineer of a second chooses still another criterion for his line of demarcation—range. He believes that the turbo jet will control ranges up to from 400-700 miles, and that the reciprocating engine will continue to hold its own at ranges over 3,600 miles. In between these ranges what type of power plant will prove superior is still indeterminate.

Minimum horsepower limitations on the gas turbine grow out of the fact that it is far more difficult to build an efficient small turbine than an efficient large one. This has been demonstrated time and again in experience with steam turbines. Two of the principal reasons are tip velocity and clearances. In the former it is obvious that a small rotor has to turn faster than a large one to achieve the same tip velocity. This in turn requires more substantial reduction gear to harness the energy to a propeller. In the matter of clearances it is desirable to hold the clearance between the stationary nozzles and the rotating wheel to a minimum. Once this minimum is obtained, it is an absolute figure and cannot be reduced as the size of the turbine is reduced. Percentagewise, therefore, it increases as the size of the turbine decreases with a corresponding loss in efficiency.

Turbine May Weigh More

Still another limitation on the small turbine is the ratio of weight to horsepower which increases as the size of the turbine goes down. It is still too early to give precise figures on this change in the weight/horsepower ratio, but it is quite possible that a point will be reached on the horsepower scale where the turbine will actually weigh more than a reciprocating engine of equal output.

Speed, altitude and range demarcations between the turbine and reciprocating engine appear to be based on two major considerations—the proportion of thrust that the propeller driving turbine will derive from jet exhaust, and the difference in the power-consumption curves in the two types of engine. Regarding the first, engineers point out that at least 10 percent and possibly a much higher percentage of the propulsive output of the propeller driving turbine will be derived from jet thrust, and that this is far more effective at high speed and high altitude. Reciprocating engines likewise derive considerable propulsive effect from jet thrust—some engineers believe they can get more than the gas turbine—but there seems to be some reason for believing that more of this waste energy can be harnessed at low speeds and low altitudes with the conventional engine-turbo-supercharger combination than with the straight turbine. What it really amounts to is the fact that there is still plenty of room to improve the efficiency of the conventional engine as well as that of the gas turbine.

The power-consumption curves are another matter. Here there is a basic difference between the two types of en-

New Name for Chamber

Climaxing a long-discussed change in the name of the Aeronautical Chamber of Commerce, the Board of Governors has approved a proposal to adopt the name "Aircraft Industries of America." The name change will be submitted to the membership for a vote.

Aviation Calendar

May 15—Meeting of Nevada State Airmen, Reno. George Crockett, Las Vegas, Chairman.

May 29-30—Mid-Canada Air Conference, Winnipeg.

June 5—Meeting Washington section, Institute of Aeronautical Sciences, Washington, D. C.

June 7-9—Annual convention, Aviation Writers Association, Chicago.

July 30—Executive Committee, International Air Transport Association, meeting in Paris.

Sept. 2—Interhemisphere conference on frequency allocations and revisions, Rio de Janeiro. (Postponed from June 2).

Oct. 16—First annual meeting, IATA, Montreal. (tentative).

Oct. 31-Nov. 3—National Aviation Clinic, Oklahoma City. Pre-clinic conference Oct. 27.

gine, with the gas turbine yielding its maximum efficiency at from 90-95 percent of its maximum power, while the reciprocating engine yields its maximum efficiency at from 50-60 percent. This brings the question of which is preferable directly to the point of what type of operation is planned. If speed is to be held absolute, undoubtedly the turbine offers an advantage, but if range in terms of both distance and time is to be an important factor, then the ability of the reciprocating engine to throttle back and save fuel will undoubtedly warrant serious consideration.

Most turbine advocates are inclined to assume that all fuel consumption problems will be overcome by metallurgical development. Without doubt this is the single most important factor facing turbine engineers, but it is by no means the only factor to be considered if the fuel consumption level of the turbine is to be brought down to that of the reciprocating engine, particularly when one stops to consider that reciprocating engines, too, are certain to benefit from these same metallurgical developments. Other factors which will have to be introduced include heat regenerative systems, which while reducing fuel consumption may add to the weight and complication of the turbine, and other accessory devices. Even water injection is a good possibility according to one engineer, although it might be ruled out by the weight of water involved.

Does Turbine Fuel Cost Less?

One point often advanced in favor of the turbine is the low cost of its fuel in comparison to aviation gasoline. Actually this is somewhat of a misconception. Present estimates are that the maximum price differential will not exceed 3 cents per gallon from standard aviation gas. This is based on the fact that as quantity demands increase, oil companies will not be able to utilize by products to produce such fuel, and further on the fact that specifications will eventually be set up in order to achieve maximum performance that will be just as difficult and expensive to meet as those now in effect for aviation gas.

But while the gas turbine is still in the development stage and offers many problems yet to be solved, no power plant engineer or engine manufacturer would suggest for a minute that it isn't destined to occupy an important place in the future of both commercial and military aircraft. The proof of this is that they are all working assiduously on turbine development.

First Annual IATA Meeting Tentatively Set for Oct. 16

To be Held in Montreal; 41 Active, 11 Associate Members Sign Articles

THE INTERNATIONAL Air Transport Association which was formally organized at Havana, Cuba, on April 19 with the formal signing of the articles of organization by 41 active and 11 associate airline operating members, will hold its first annual meeting in Montreal this fall. A tentative date of October 16 has been set.

Meantime, the nine-man executive committee, which constitutes the management group for the association, will meet July 30 in Paris, France, with Rene Briand, of Air France, as host.

Classification of membership in the Association was determined as follows:

An active member is an air transport enterprise which operates a scheduled air service under proper authority in the transport of passengers, mail, or cargo for public hire between the territories of two or more States, under the flag of the State eligible to membership in the International Civil Aviation Organization as provided for in Chicago in 1944.

Associate Member Defined

An associate member is any other air transport enterprise operating a scheduled air service under proper authority in the transport of passengers, mail, or cargo for public hire under the flag of a State eligible to membership in the International Civil Aviation Organization.

Thus, even an air operation that is scheduled but which has a service not open "to public hire" is not eligible. This would include contract carriers that operate non-scheduled or scheduled services.

The final balance of power in the selection of the nine-man executive committee was considered to be fair for all countries and operators concerned, with a few exceptions which doubtless will be remedied at the Montreal meeting. Four places on the committee are vacant at the discretion of the organization, and one of these ultimately may be filled by Russia.

The two British representatives, smart and able Maj. J. R. McCrindle of British Overseas Airways Corp., and Hudson Fysh, long-time managing director of Qantas Empire Airways (Australia), are matched by the two U. S. representatives —John C. Cooper, vice-president of Pan American Airways and John E. Slater, vice-president American Export Airlines.

Indian National Airways, represented by A.F.T. Cambridge, director, was considered by some to be British. But both Cambridge and the company have denied vigorously that this representation is British, directly or indirectly. About 95 percent of the stock in Indian National Airways is owned by Indian nationals. The election of H. J. Symington, president of Trans-Canada Air Lines, as the first president, was not only an individual tribute to a man who contributed vastly to the success of the conference, but because he will be host to the first annual meeting at Montreal.

In the May 1 issue of *American Aviation*, an error in wire transmission occurred in the name of the representative from Brazil on the executive committee. The correct name is Dr. J. Bento Ribeiro Dantas, who is president and director of Servicos Aereos Cruzeiro do Sul, S. A., the Brazilian airline.

Members of Association

The final official list of active members of the International Transport Association follows:

Australia: Qantas Empire Airways Ltd.

Belgium: Societe Anonyme Belg Exploitation Navigation Arienne "Sabena."

Brazil: Empresa de Viacao Aerea Rio Grandense, S. A.; Panair do Brasil, S. A.; Servicios Aereos Cruseiro do Sul.

Canada: Trans-Canada Air Lines.

China: China National Aviation Corp.

Cuba: Expreso Aereo Inter-Americano.

Czechoslovakia: Ceskoslovenska Letecka Spolecnost; Ceskoslovenska Statni Aerolinie.

Denmark: Det Danske Luftfartselskab.

El Salvador: TACA, S. A.

France: Air France (Reseau des Lignes Aeriennes Francaises).

Honduras: Transportes Aereos Centro Americanos, S. A.

India: Indian National Airways.

Ireland: Aer Lingus Teoranta.

Mexico: Cia. Mexicana de Aviacion, S. A.

Netherlands: K.L.M. Royal Dutch Airlines.

Netherlands East Indies: Royal Netherlands Indies Airways.

New Zealand: Tasman Empire Airways Ltd.

Norway: Det Norske Luftfartselskap; Fred. Olsen & Bergenske; Royal Norwegian Air Transport.

Poland: Polish Air Lines (LOT).

Spain: Compania Iberia.

Sweden: A.B. Aerotransport & Swedish Intercontinental Airlines (SILA).

Switzerland: Swissair Traffic Company Ltd.

United Kingdom: British Overseas Airways Corp.; Wrightways Limited.

United States: American Airlines, Inc.; American Export Airlines, Inc.; Braniff Airways; Colonial Airlines; Northeast Airlines, Inc.; Northwest Airlines; Pan American Airways; Pan American Grace Airways; Transcontinental & Western Air, Inc.; United Air Lines, Inc.; Western Airlines.

West Indies (British): British West Indian Airways.

The final official list of associate members of the Association follows:

Brazil: Empresa de Transportes Aereovias Brasil.

Colombia: Lineas Aereas Taca de Colombia.

Costa Rica: Cia. de Transportes Aereos Centro Americanos de Costa Rica, S. A.

Cuba: Cia. Cubana de Aviacion, S. A.

Mexico: Taca de Mexico.

Nicaragua: Cia. Nacional Taca de Nicaragua.

Panama: TACA Airways.

Paraguay: Aerovias Paraguayas, S. A.

United Kingdom: Allied Airways (Gandar Dower) Ltd.; Portsmouth Aviation Limited.

United States: All American Aviation, Inc.; Delta Air Lines; Eastern Air Lines, Inc.; National Airlines, Inc.; Pennsylvania-Central Airlines.

Venezuela: Linea Aerea Taca de Venezuela; Linea Aeropostal de Venezuela.

Interim Council Will Meet Within Next Few Months

Canada Will Set Date; Twelve Nations Have Accepted Agreement

By W. L. RUSSELL

STATE DEPARTMENT officials are encouraged by indications that the first meeting of the Interim Council of the Provisional International Civil Aviation Organization will be held "within the next few months." Some believe the Council will meet in late June or July.

The 20 nations chosen to serve on the Council must accept the Interim Agreement, drawn up at the International Civil Aviation Conference in Chicago, by June 7 or lose their rights to seats on the Council.

The Interim Agreement will become effective when 26 nations have accepted. Twelve countries have made final notification of their acceptance. They are: United States, Canada, The Netherlands, Norway, Ethiopia, Poland (Polish Government in Exile), Belgium, Czechoslovakia (Czechoslovakian Government in Exile), New Zealand, Liberia, Cuba and Egypt.

Several others are believed to have taken the necessary measures to accept, but have not transmitted their acceptances to the U. S. Government.

Canada will set the date for meeting of the Council, and then according to State Department officials, the U. S. will name its representative on the Council.

The 20 nations chosen at Chicago to serve on the Council are: United States, United Kingdoms, The Netherlands, Brazil, France, Mexico, Belgium, Canada, India, Norway, Iraq, Peru, China, Australia Egypt, Czechoslovakia, Turkey, El Salvador, Chile and Colombia.

One seat on the 21-member council was left open for Russia, which did not attend the Chicago Conference.

The first seven nations were selected as "member states of chief importance in air transport." The next five were "member states not otherwise included which make the largest contribution to the provision for facilities for international civil air navigation," and the last eight were "member states not otherwise included the election of which will insure that all major geographical areas of the world are represented."

The Council will have three important committees—air transport, air navigation and international convention. The first committee will continue study of subjects on which nations were unable to agree at Chicago—quotas, escalators, etc. The second committee will continue study on communications systems, rules of the air, airworthiness, etc., while a third group will give further consideration to an international convention.

The Interim Council will have certain powers in connection with the Two Freedoms and Five Freedoms documents. If a state believes that it has suffered hardship under either document, it may ask the Council to examine the situation and consult the states involved. Should each consultation fail to solve the difficulty, the Council may make appropriate findings and recommendations to the states involved. If a state unreasonably fails to take suitable corrective action, the Council may recommend to the Interim Assembly, on which each nation has a seat, that such state be suspended.

New Magazine, 'Whites Aviation' is Published

A new aviation magazine, *Whites Aviation*, has appeared in New Zealand with the March issue. Managing-director and editor is Leo White, well known photographer and aviation writer in that country and who until recently was in the Royal New Zealand Air Force. The first issue contains greetings from various aviation leaders in the United States. Editorial and publication offices are at 605 Dilworth Bldg., Queen St., Auckland C.1.

Whites Aviation is the New Zealand representative of the American Aviation Publications. The annual subscription rate is $3 American money, and subscriptions may be obtained through American Aviation, American Building, 1317 F Street, Washington 4, D. C. Advertising rates may be obtained from the same source.

IATA Traffic Group Meets in New York

An 11-man traffic advisory committee of the International Air Transport Association held its first meeting in New York May 10. Performing somewhat the same functions as the Air Traffic Conference of America for the U. S. airlines, the new committee was authorized at the organization meeting of IATA at Havana in April and members appointed by the IATA executive committee.

Members from the U. S. are: V. A. Chenea, v. p. of Pan American Airways, Charles Rheinstrom, v. p. of American Airlines; Paul Brattain, 1st v. p. of Eastern Air Lines; and E. O. Cocke, v. p. of TWA.

Other members are: Jack Dalby, traffic manager, Trans-Canada Air Lines; Charles Gallo, TACA, S. A.; L. F. Bouman, K.L.M., Royal Dutch Airlines; Torsten Soderquist, traffic manager, Swedish Air Lines; Henri Lesieur, Air France; and Dr. Henryk J. Gorecki, Polish Air Lines.

Fords for Ecuador

The Wichita Falls Air Transport Co., Wichita Falls, Texas, has just completed converting two tri-motor Fords into cargo planes for the Shell Oil Co. for use in Ecuador. A large cargo door was cut in each plane through which a pipe 23½ feet long can be loaded. The Wichita Falls company also is converting Boeing 247s for passenger use by Aero Transportes, S. A. Some DC-2s also are being converted there for Northern Airways of Fairbanks, Alaska.

Secretary Wallace Solos in Ercoupe

Secretary of Commerce Henry A. Wallace recently soloed in his private flying course at Washington National Airport. He went up alone after seven and one-half hours of instruction in an Ercoupe.

He is very enthusiastic about continuing his training and plans to proceed toward a private license, according to his instructor, Paul Young assistant chief of the CAA's general inspection division. The plane is hangared at National Airport, but most of Secretary Wallace's instruction flights have been from a Navy field not far from Washington.

Power of President To Sign Executive Pacts Questioned

The President does not have the power to make executive agreements giving foreign airlines the right to operate to the United States, Arne C. Wiprud, special assistant to the Attorney General in charge of transportation cases for the Anti-Trust Division, writes in the April issue of the George Washington University *Law Review*.

"Under existing law . . . . the conclusion of executive agreements to effect an exchange of operating rights is without legal basis. Such executive agreements, to have legal validity, would require the adoption and ratification of a treaty between the governments concerned," Wiprud contends.

While this is an unofficial opinion, considerable weight is being attached to it in aviation circles because Department of Justice policy requires that all articles, written by the Department of Justice Staff, must be cleared for publication.

Wiprud's opinion undoubtedly will strengthen the position of certain Senators, notably Owen Brewster (R., Me.) who have led the fight to have all of the executive agreements reviewed by the Senate. Brewster's colleague, Sen. Wallace H. White, Jr. (R., Me.), has submitted a resolution to the Senate Foreign Relations committee which, in effect, would hold in abeyance all further negotiations by the State Department in its efforts to arrange reciprocal operating rights with foreign countries. The resolution asks that agreements be withdrawn and foreign countries notified that the Senate has a treaty under consideration. The committee has held hearings on the question but at this writing had not reached a decision.

Poland Ratifies 3 Agreements

Poland has accepted and ratified the following agreements as concluded at the International Civil Aviation Conference in Chicago: interim agreement, transit agreement, and the convention on international aviation. Announcement of Poland's acceptance and ratification of the three documents was made by the U. S. State Department.

With the Cameraman in Havana as World

Final full meeting for purpose of signing the articles of organization. Seated at long table, facing camera, are seven of the nine members of the executive committee and Dr. Luis Machado, who presided at the conference. Left to right—John E. Slater, United States; Per A. Norlin, Sweden; Rene Briand, France; John C. Cooper, United States; Dr. Machado; Maj. J. R. McCrindle, Great Britain; A. F. T. Cambridge, India; and Dr. J. Bento Ribeiro Dantas, Brazil. Two members of the committee—Albert Plesman, Netherlands, and Hudson Fysh, Australia—were not present when this picture was taken.

L. F. Bouman (KLM), Per A. Norlin (Sweden), E. O. Cocke (TWA), Brig. Gen. T. B. Wilson (TWA), and Jack Nichols (TWA).

H. Ainsley Highman of Boston, representing United Air Lines (on left), chats with Col. C. Y. Liu of China National Aviation Corp., and Guy Evans of the sales department of Douglas Aircraft.

H. Ainsley Highman, United Air Lines; Vernon Crudge, BOAC; Dr. Daniel Goedhuis, Netherlands; Tore Nilert, Sweden; John Stewart, BOAC; L. F. Bouman, Netherlands; and Per A. Norlin, Sweden.

Left to right: F. W. Farey-Jones of Great Britain who represented CIATO; Stuart Tipton, acting president of the Air Transport Ass'n of America, and Dr. Daniel Goedhuis, who was secretary of IATA, which was headquartered at The Hague.

Air Transport Association Was Launched

H. J. Symington, left, president of Trans-Canada Air Lines, who was elected president of the new association; and Capt. M. Krog of the Royal Norwegian Air Transport.

Steering Committee which served throughout the conference. Seated (left to right): Major J. R. McCrindle, John C. Cooper, Dr. Luis Machado, and Dr. Henryk Jozef Gorecki. Standing (left to right): John Slater, Per Norlin, Dr. Daniel Goedhuis, Stuart Tipton, F. W. Farey-Jones, and L. A. Ferdinand Flocon.

John C. Cooper, chairman of the Steering Committee, speaking at the opening session. Seated at table are (left to right): Dr. Jorge de Cubas, president of Compania Cubana de Aviacion, S. A.; Per A. Norlin, president of SILA, the Swedish airline; John E. Slater, vice president, American Export Airlines, Inc.; Rene Briand, head of Air France; next man unknown; Dr. Luis Machado, president of the conference; next man Minister of State of Cuba; Mr. Cooper; the Minister of Communications of Cuba; H. J. Symington, president of Trans-Canada; Major J. R. McCrindle, British Overseas Airways; Dr. Pedro Chappa, president, Compania Mexicana de Aviacion, S. A.; and Dr. H. J. Gorecki of Polish Air Lines.

Left to right: John C. Leslie, one of the delegates from Pan American Airways; O. M. Mosier, vice president of American Airlines; and Wilbur L. Morrison, director of the Latin American division of Pan American Airways.

Hugh Knowlton, Director of Research and Planning for Eastern Air Lines, chats with Harold J. Roig, President of Pan American-Grace Airways.

Left to right: F. L. Duncan, who until recently was head of a DFC technical mission to Brazil; Leo H. Dwerlkotte, Executive Vice President, Western Air Lines; Croll Hunter, President of Northwest Airlines; Charles Rheinstrom, Vice President, American Airlines; Sam Solomon, until recently chairman of the board of Northeast Airlines; Stanley Osborne, Vice President, Eastern Air Lines; C. E. Woolman, Vice President and general manager of Delta Air Corp.; C. de Stackelberg, TWA; and Marten E. A. L. de Jong of KLM.

Ton-a-Minute Being Flown On ATC India-China Run

China Bound Plane Goes Over 'Hump' Every 2½ Minutes Night and Day

By ERIC BRAMLEY

CALCUTTA, INDIA—This is the story of the India-China Division of the Air Transport Command.

It is the story of ATC's largest division—a division that does more than half of all ATC flying, and the division that probably has the most important ATC job—keeping China supplied by air.

The difficulties of flying the famous Hump and the glamor of the operation have been written many times. But the magnitude of the operation is hard to realize until one actually has seen it—and even then it is hard to believe.

Some idea of its magnitude may be grasped from the following facts: ATC's India-China wing was activated in December, 1942, when the Japanese made shipment of supplies over the old Burma Road impossible. In the beginning, about 1200 tons were flown into China in a month, with the Douglas C-47 as the backbone of the operation. Later came the advent of the Curtiss C-46, Consolidated C-87 and C-109 (tanker) and Douglas C-54.

The result is that today ICD has put into China 44,000 tons in one month—an average of more in one day than was formerly carried in one month, an average of better than one net ton per minute. A China-bound plane crosses the Hump every two-and-a-half minutes 24 hours a day.

On August 1, 1944, the wing was made a division, shortly after Brig. Gen. Thomas O. Hardin had assumed command.

Now commanded by ablé Brig. Gen. William H. Tunner, former commander of ATC's Ferrying Division, ICD is divided into four wings:

Assam Wing—With headquarters in Chabua, Assam, this wing is now ICD's largest, carrying the main burden of the Hump operation, flying C-46s, C-87s and C-109s. It is commanded by Col. George D. Campbell, Jr., a West Point graduate, pilot, former operations officer of ATC's Pacific Wing, Army supervisor of TWA's four-engine plane school at Albuquerque, and operations officer of the Ferrying Division.

Pipe for the pipeline to China is loaded aboard an ICD plane for transport to a forward area. Note native laborers.

India Wing—This wing, headquartered in New Delhi, is responsible for the transport service operated within India, an operation conducted with C-47s. Its commander is Col. Willis H. Proctor, a 12,000-hour pilot, one-time pilot with old Colonial Western Airways, and former air inspector of the India-China Wing.

Bengal Wing—Long range delivery of supplies to China in four-engined aircraft is the primary job of this wing, which is commanded by Col. Andrew B. Cannon, an 8,000-hour pilot, at one time with Inter-City Airlines in Boston, and former commanding officer of the 6th Ferrying Group.

China Wing—This wing is responsible for receiving supplies flown from India, and also operates an extensive and important system of air routes within China. Its commanding officer is 29-year-old Col. Richard F. Bromiley, a West Point graduate, senior pilot, and former operations officer for the division.

These four wings have almost twice as many planes as the U. S. domestic airlines and they fly over 20,000 miles of routes. In 1944 they carried almost half a million passengers more than 2,500,000 miles.

ICD also has the job of providing 75,000 billets and 250,000 meals a month for transient personnel moving over its air routes.

Assignment in Calcutta

This reporter has spent many days at ICD headquarters in Calcutta, and has visited some of the wings, particularly the Assam Wing, which is the largest, in an attempt to grasp the scope of the job being done, and to learn the problems confronting the division.

The conclusion to be reached is that ICD's tremendous cargo and passenger hauling job is being constantly improved and is more and more approaching airline standards, although Gen. Tunner emphasizes that the operation cannot be compared with an airline because its job is mass transportation under different conditions.

Gen. Tunner points out that the division has at times been handicapped by lack of certain materials and supplies, but has gotten along with what it had, and shown constant improvement. Aircraft utilization, he pointed out, compares favorably with that of a domestic airline, even over the Hump. "Production line" maintenance has been introduced—a system under which an aircraft moves from station to station on a line, similar to an aircraft manufacturing plant. In this way a better job is done and personnel can specialize in one particular branch of work.

The accident rate on the Hump is constantly decreasing, Gen. Tunner says. He attributes the improvement to better airplanes, better maintenance and more experienced pilots.

Not only over the Hump, but in the other wings as well, operations are becoming safer, maintenance is improving, tonnage is increasing. Airline men are liberally sprinkled throughout the division, and they have contributed immeasurably to the success of the operation.

A cargo of shells ready for shipment. Note wide aisle left for crew.

An operation of this scope presents problems—plenty of problems. Probably the three outstanding ones are traffic control, the constant struggle to improve maintenance, and the drive to increase tonnage while at the same time keeping the operation safe.

Traffic control has been a tough nut to crack. The slap-dash methods of the past are gone. Many of the facilities are comparable to those in the U. S. But when on some days there are over 500 round trips a day over the Hump (some 40% of all ATC flying is done over the Hump), the saturation point is sometimes reached. At one airport in China, as many as 60 planes have been "stacked up" waiting to land.

"It's not too unusual to call the tower and be told 'you're number 46 to land,'" one pilot told me. "One day it took me over two hours to land—almost as long as it took me to fly across the Hump."

At the present time, traffic control procedure is probably as complete as it can be. There is a regular airways traffic control system, as in the U. S., and instrument let-down procedures have been established. Radio range stations are used. The attempt now is to improve the use of the present system.

Aircraft maintenance over here is a constant fight against the weather, high altitude flying, shortage of parts, and the necessity of training sufficient men to do the job.

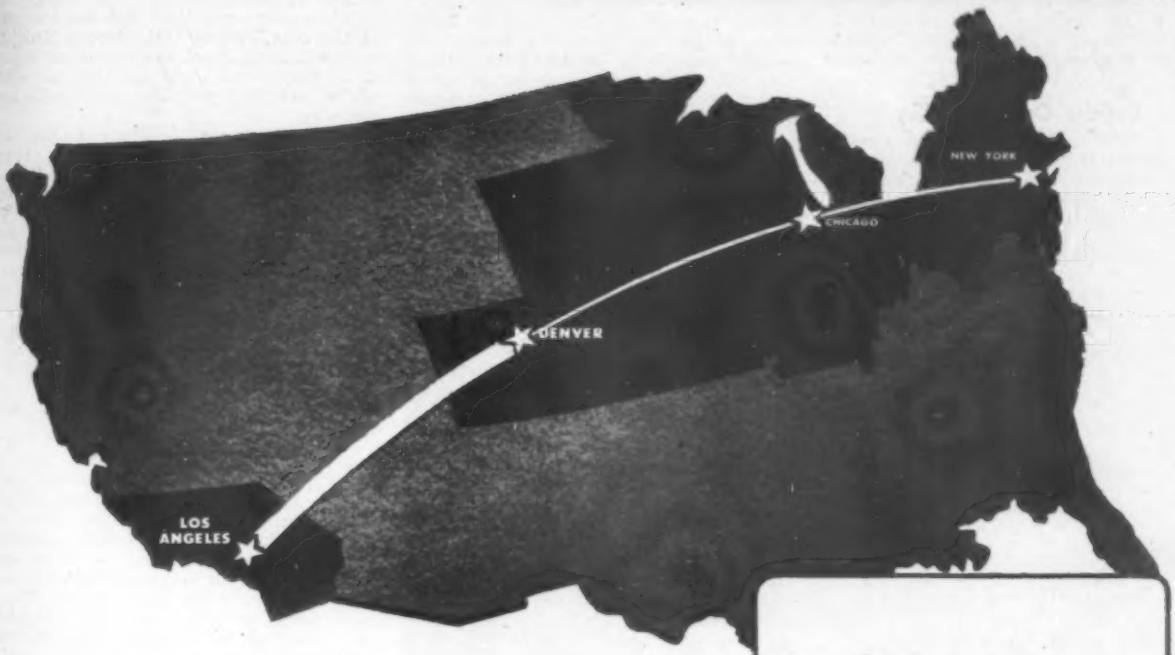
"We're out of the horse-and-buggy

The frame of a road grader is loaded aboard a C-46.

WESTERN AIR LINES' "CUT-OFF" ROUTE

THE *"Natural"* AIRWAY...

THAT SAVES TIME FOR 85 MILLION PEOPLE!



WESTERN AIR LINES' "cut-off" route between Denver and Los Angeles — to be opened in the near future — is a natural airway that will bring faster passenger, air mail, express and cargo service to 85 million people.

The areas which will directly benefit — as shown on the map — encompass 64 per cent of the people of the country... most of the heavy industrial and agricultural production... and practically all the big population centers. Western Air's "cut-off" is a natural because it completes the only airway that closely follows the natural global — "great circle" — route coast-to-coast. It cuts flying time between Denver and Los Angeles by 2 hours, reduces New York-Los Angeles air mileage to 2543, shortest of any airway.

Western Air Lines was first to recognize the importance of the "cut-off," dates its development from 1936 when the route was mapped. Inauguration of service will culminate a long list of achievements which the company has recorded during its 19 years of pioneering air transportation for the West.

General traffic office: 510 West Sixth Street, Los Angeles 14

Air travelers will view the scenic splendor of Western Air's Denver-Los Angeles "cut-off" route from big DC-6 Douglas luxury airliners. Costing a half-million dollars each, these giant transports will carry 50 daytime passengers at a cruising speed of 300 miles per hour... will incorporate every postwar accommodation and safety device.

When Western Air launches cargo service over the Denver-Los Angeles "cut-off" in early summer, shipping of fruit, vegetables, and other table delicacies to Eastern markets will be speeded up... manufactured items will move equally fast from Eastern production centers to the West Coast.

WESTERN AIR LINES

AMERICA'S PIONEER AIRLINE

stage of maintenance and we're flying the pants off these planes," says Col. Robert B. White, director of aircraft maintenance, formerly with North American Aviation and a consultant for TWA. Operations in this theater are tough on airplanes and engines, he emphasizes, pointing out that high altitude flying, severe turbulence, use of excessive engine power and severe icing conditions are only a few of the many headaches. In spite of these, however, aircraft utilization is anywhere from seven to ten hours daily.

Definite Overhaul Policy

A definite overhaul policy on engines and planes is followed by the division. C-46 engines (Pratt & Whitney) are overhauled at 750 hours, or sooner if necessary, while C-47 engines (also Pratt & Whitney) are pulled at a maximum of 875 hours. Aircraft receive major overhaul at from 2,000 to 3,000 hours.

Considering the operating conditions, engine life has been remarkable, says Maj. S. G. Nordlinger, powerplant specialist, formerly with Continental Motors. The Hump, he points out, has been the proving ground for planes and engines. "I'll be a darned-sight smarter engineer when I go home as a result of my experience over here," he adds.

In general, GI mechanics have done an excellent job. Many of them received "on the job" training, never having worked with airplanes or aircraft engines before. Some of them have come up with ideas that have improved operations. For example, Staff Sergeant Carson C. Morse, of Marion, O., invented a method of gyro heating that increased gyro life from less than 50 hours to more than 200.

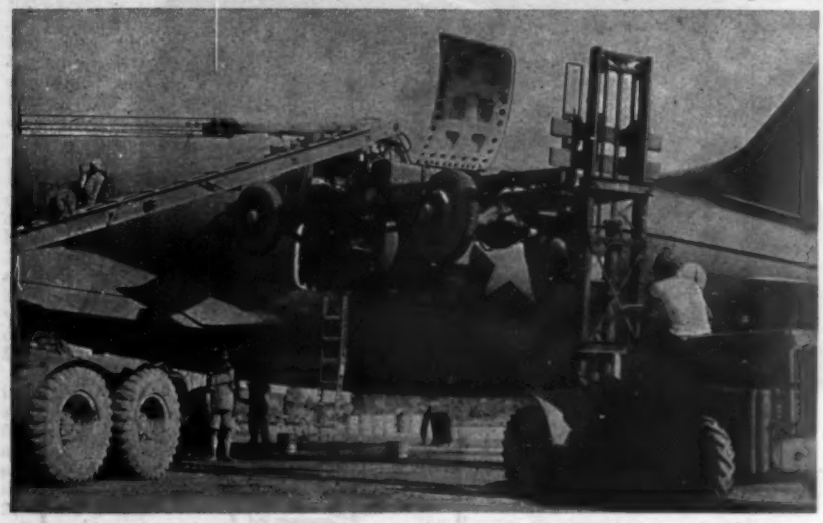
Increasing tonnage while at the same time keeping the operation safe involves not only the aircraft—it involves the pilots. Slowly but surely these pilots are gathering the necessary know-how, learning about icing conditions, monsoon flying, etc.

One ironical fact is that just when a pilot has become seasoned and learned the tricks of Hump flying, he is eligible for rotation and is sent home. This necessitates constant training of new pilots.

No one believes that the Hump pilots should not be sent home after a certain number of hours. Hump flying is tough —any pilot who has flown 750 hours over the Hump has spent at least 600 of them on oxygen and half of them on instruments. But the fact remains that rotation complicates things.

Until recently, a pilot could go home when he had completed 650 hours. By being "eager" he could gather these hours in an amazingly short period of time—six months by flying 110 hours a month. This race to build up time resulted in pilots flying when they were tired, sometimes taking unnecessary chances.

Now, however, a pilot must fly 750 hours and must stay here one year to become eligible for rotation. This keeps more experienced pilots available, and spaces out their time. It is working out satisfactorily, despite understandable complaints from some of the pilots.



A fork lift and a crane maneuver a large truck into a hatch. Loading was completed in seven minutes.

A visit to the Assam Wing is an eye-opener. It's an operation the size of which is hard to believe.

Supplies reach the Upper Assam Valley by water and rail. There are direct air connections to and from the west, the south and the east. There are huge warehouses containing a vast amount of material awaiting transportation to China —material of all kinds, material that one would never have dreamed of transporting by air a few short years ago. It's a preview of postwar air freight transportation.

Planes Drone Constantly

And, in the Upper Assam Valley with its seven ATC bases, it's impossible to be anywhere, day or night, where you don't hear the drone of an airplane, either on its way to China, or returning.

The seven bases function under the efficient direction of Col. George Campbell. Three of them are commanded by former airline men, the remainder by men with Army backgrounds. The 1327 Base Unit, under Maj. T. B. Steele, handles four-engined aircraft—C-87s and C-109s. The 1330 BU, commanded by Col. William S. Barksdale, is also a four-engined field. The 1328 BU, headed by Lt. Col. Claron U. Pratt, former United Air Lines captain; the 1329 BU under Maj. Jacob L. Sutton; the 1332 BU, with Lt. Col. Vilas C. Rice commanding; the 1333 BU, under Lt. Col. Charles F. Skannal, former United Air Lines pilot, and the 1337 BU, headed by Lt. Col. George S. Cassady, former chief pilot for Braniff Airways, are all C-46 bases.

"We'll carry anything that we can get in the door," states Maj. George Knight, former Eastern Air Lines station manager at Newark, who now has the sizeable job of handling priorities and traffic for the wing.

And his statement is borne out by the facts. Only one item has ever been turned down for Hump transportation—a complete C-46 wing that could not be broken down. Large trucks (one of them was loaded into a plane in seven minutes), road scrapers, bulldozers, Bofors guns, 7,770-lb. armatures, gasoline segregators, 100-lb. to 1,000-lb. bombs, gasoline, food, medical supplies, ammunition, aircraft engines, post exchange supplies, blood plasma, soldiers, horses, and mules have all traveled across the Himalayas by airplane. Some items, like road scrapers, have been cut up, flown across, welded together and put to work.

Fork Lift Invaluable

The fork lift has proved invaluable in loading the planes. The tie-down equipment used on loads over the Hump is almost exclusively that manufactured by Evans Products Co. Loaders state that it has worked out very satisfactorily, and that they could use more of it. There have been instances of planes making belly landings without the loads shifting.

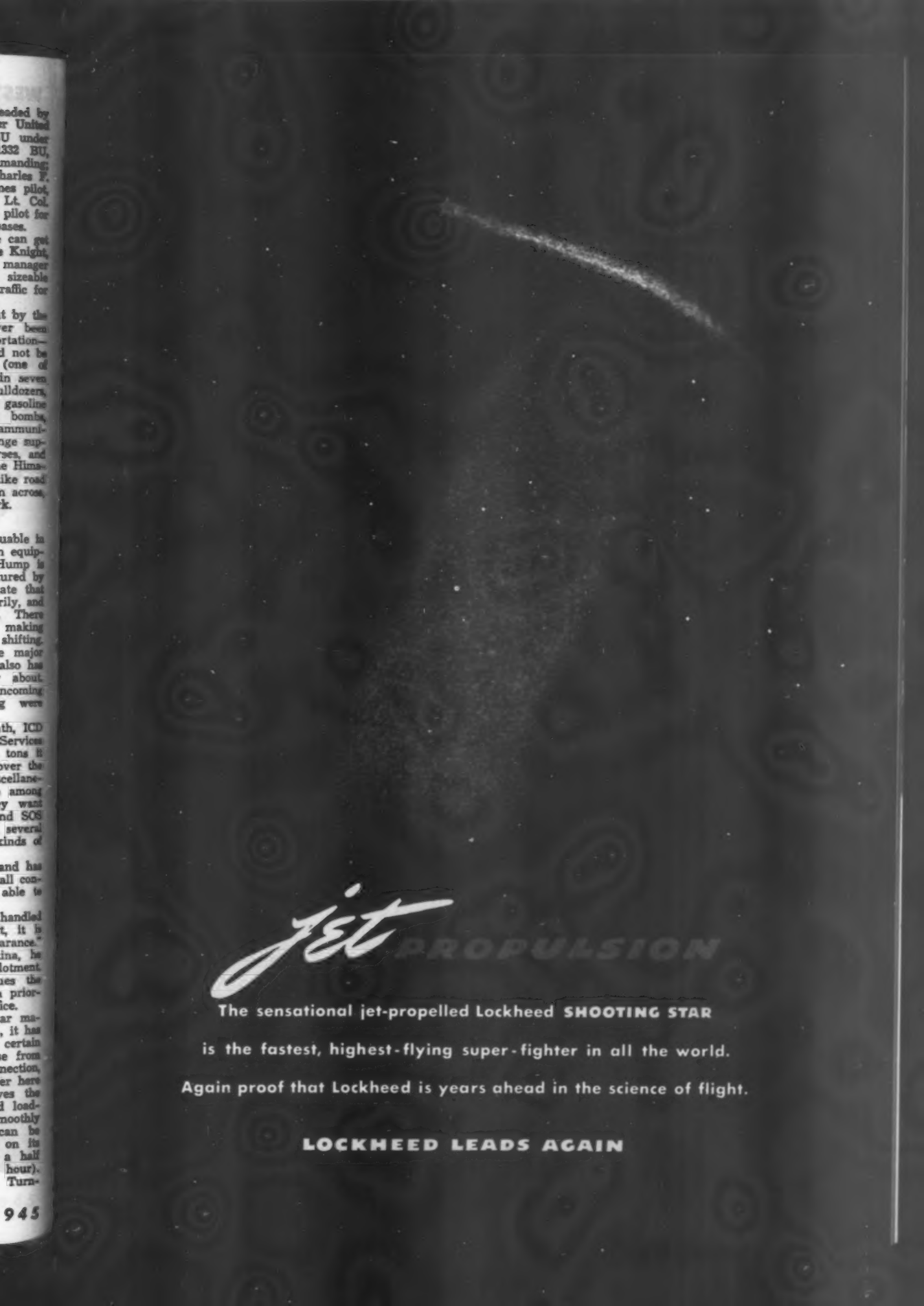
Although cargo is by far the major business of the Assam Wing, it also has plenty of passengers to worry about. In a recent month, over 16,000 incoming passengers and 10,000 outgoing were handled by the bases.

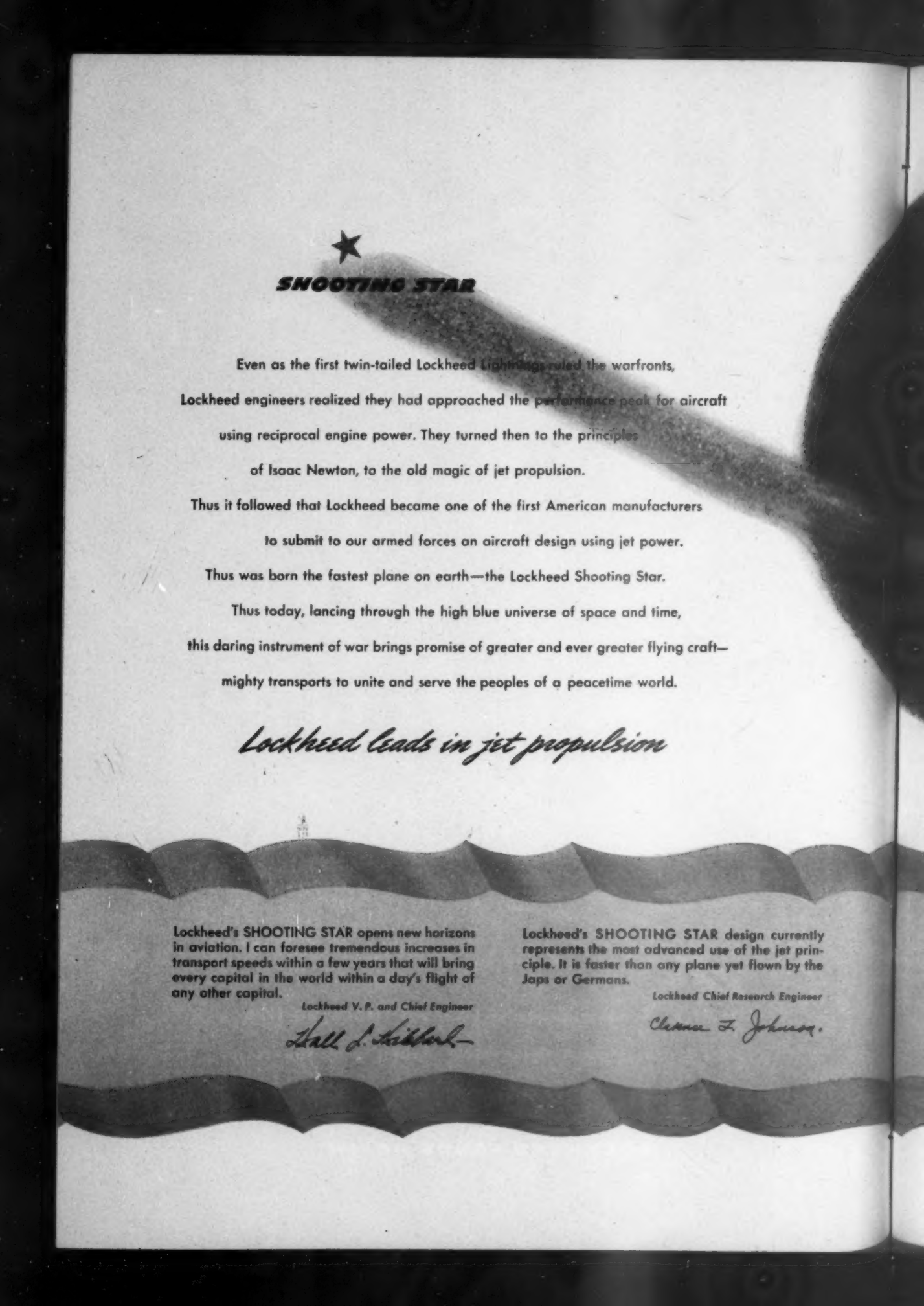
At the beginning of each month, ICD tells Air Service Command and Services of Supply in China how many tons it estimates it will be able to put over the Hump. ASC, SOS and a few miscellaneous agencies divide this tonnage among them, informing ATC what they want carried. ATC then tells ASC and SOS on the India side which of the several bases will handle the different kinds of material.

The system is well organized and has worked out to the satisfaction of all concerned. ATC has always been able to handle the material requested.

Passengers over the Hump are handled in an interesting manner. First, it is necessary to obtain "Hump clearance." When a passenger rides to China, he rides on someone's tonnage allotment. Thus, either ASC or SOS issues the necessary clearance and assigns a priority, through a Hump control office.

Because there are so many war materials to be transported to China, it has been necessary for ICD to make certain that it secures the maximum use from its transport fleet. In this connection, "turnaround"—a familiar word over here —has been perfected. It involves the complete servicing, unloading and loading of a plane. It is working smoothly — a plane arriving in India can be "turned around" and sent back on its way to China in an hour and a half (it has been done in half an hour). Bulky loads take a little longer. Turn-


jet PROPULSION
The sensational jet-propelled Lockheed SHOOTING STAR
is the fastest, highest-flying super-fighter in all the world.
Again proof that Lockheed is years ahead in the science of flight.
LOCKHEED LEADS AGAIN



SHOOTING STAR

Even as the first twin-tailed Lockheed Lightnings ruled the warfronts,
Lockheed engineers realized they had approached the performance peak for aircraft
using reciprocal engine power. They turned then to the principles
of Isaac Newton, to the old magic of jet propulsion.
Thus it followed that Lockheed became one of the first American manufacturers
to submit to our armed forces an aircraft design using jet power.
Thus was born the fastest plane on earth—the Lockheed Shooting Star.
Thus today, lancing through the high blue universe of space and time,
this daring instrument of war brings promise of greater and ever greater flying craft—
mighty transports to unite and serve the peoples of a peacetime world.

Lockheed leads in jet propulsion

Lockheed's SHOOTING STAR opens new horizons in aviation. I can foresee tremendous increases in transport speeds within a few years that will bring every capital in the world within a day's flight of any other capital.

Lockheed V. P. and Chief Engineer

Hall L. Hibbard

Lockheed's SHOOTING STAR design currently represents the most advanced use of the jet principle. It is faster than any plane yet flown by the Japs or Germans.

Lockheed Chief Research Engineer

Clarence L. Johnson

Lockheed's SHOOTING STAR is a pilot's airplane—clean, fast, maneuverable. It has a terrific fire power. There is no comparable airplane in the air today.

Lockheed Chief Engineering Test Pilot

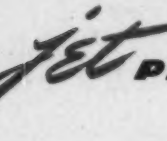
Lockheed's SHOOTING STAR is comparatively simple to build, service, repair and fly. Five factories are concentrating on mass production to meet the demands of the United States Army.

Lockheed P-80 Production Supervisor

LITTLE-KNOWN FACTS ABOUT

Jet PROPULSION

(1) Most common misconception concerning jet propulsion is the idea that forward thrust of the airplane is obtained by the rush of hot gases from a narrow opening pushing against a cushion of air behind the plane.



(2) The jet principle derives from elementary physics: *to every action there is an opposed reaction which is equal in force and opposite in direction.* For instance, (see the above diagram), explosion (A) creates equal forces (B) and (C).

(3) In jet propulsion force (B) is the impelling force of the airplane. It is captured by the front end of the jet engine. Force (C), although equal, is dissipated as compressed gases escape through the narrow jet opening at rear of the plane.

(4) The entire motion of the jet-propelled airplane is caused by internal pressures. Air resistance opposing this movement is minimized by advanced design, such as that incorporated in the Lockheed Shooting Star.

LOCKHEED

LOOK TO *Lockheed* **FOR LEADERSHIP**

Years ahead in the science of flight

LOCKHEED AIRCRAFT CORPORATION · BURBANK, CALIFORNIA

around on the China side requires even less time.

Here is how turnaround works: As the plane approaches its Assam base, it calls the tower. When the tower operator gets the call and assigns an altitude at which the plane may enter the flight pattern over the station, he also receives a report on the ship's status—affirmative or negative.

An affirmative report means that the ship is ready to go back over the Hump again with only minor mechanical attention (negative means that some repair is necessary). The tower notifies Operations of the impending arrival of the ship and Operations assigns a dispersal area for the plane. As the ship calls in on its base leg, then on its final approach to the field, the dispersal number is given to the pilot.

Meanwhile, as the ship taxis to the dispersal, Operations has informed the various sections of the field, including Priorities and Traffic and Engineering. If there is incoming cargo aboard, Space Control will have notified Air Freight, and the latter will have trucks meet the plane to unload it, ready by the time the engines are cut.

GIs and coolies will unload the cargo. While the unloading goes on, the new load destined for China will approach in trucks, for they have been filled with freight and standing by to load this and all the other planes that come in.

Gas Crew on Hand

Engineering will have a gas crew at the ship before it is unloaded. Gasoline will be pumped in from a tractor-trailer unit, oil put in as needed. Oxygen will be added to the depleted supply for the crew, and necessary minor adjustments will be made by mechanics after they have conferred with the crew which brought the ship in.

Radio maintenance checks over the ship's equipment as the four-ton load is placed aboard the C-46. Distribution of weight is scientifically calculated, and all cargo securely tied down.

After each bit of maintenance has been accomplished, information goes to the Maintenance Dispatcher, who keeps track of the functions performed by subsections of the engineering department.

Thus the plane is made ready to go. While all this has been going on, a complete crew has been called and transported to Operations. Here the clearance for the aircraft is made out, and the crew is briefed on conditions to be encountered en route. Going to their plane, the crew is ready for the flight.

The number of former airline men in ICD is so large that it is impossible to secure a complete list. From various sources, however, the following names have been secured, in addition to those already mentioned:

Col. Russell Munson, formerly in charge of United Air Lines' new route development work, commanding officer of a base in the India Wing; Lt. Col. Clayton Joyce, United captain, commanding officer of a base in the Calcutta area; Lt. Col. Silas A. Morehouse, TWA captain, commanding officer of a base in the Bengal Wing; Lt. Col. Harvey Miller, American Airlines, director of maintenance and engineering at an India base; Lt. Col. Winfield Kessler, American Airlines, assistant chief of staff, priorities and traffic; Lt. Col. Thomas Parks, United, deputy assistant chief of staff, operations; Lt. Col. J. O. Briggs, American Airlines, service officer; Maj. Basil F. Warnock, American field supervisor, deputy commander, Assam Wing; Maj. Charles Basley, American maintenance in New York, Assam Wing engineering officer. Maj. John H. Keebler, TWA, priorities and traffic director at an Assam station; Maj. John Cathey, American sales in New York, P&T director at an Assam station; Maj. Lawrence D. Schwartz, Eastern's Washington sales, P&T director at a China station; Maj. Arthur LaVore, United public relations at Los Angeles, P&T director at a China station; Maj. Robert Littel, TWA, liaison officer in India Wing.

Maj. Clyde Courtwright, TWA traffic in Pittsburgh, P&T director; Maj. Robert Merrill, chief of American stewardesses in Dallas, deputy chief of staff, P&T, in China; Maj. Sam Lieb, United, special assistant to the commanding general on passenger service; Maj. Tront Sundum, Eastern New York sales, traffic officer; Maj. Richard Waugh, Eastern station manager, assistant division operations officer; Maj. Paul Slayden, Eastern captain, director of operations at an India base; Maj. George Lusk, TWA, P&T director at a Bengal base.

Capt. William Grinnell, consolidated ticket office, Chicago, priorities control officer, Assam Wing; Capt. Foster Knight, United, traffic liaison officer to China theater; Capt. John Kelly, American reservations in New York, India base passenger officer; Capt. Ledyard Gardner, United traffic, New York, India station P&T director; Capt. Elton Sheppard, Eastern traffic, air freight officer in India Wing; Capt. Maurice de Groff, consolidated ticket office, Chicago, division passenger officer.

Lt. Bruce Magill, Pan American Airways in Guatemala, P&T officer, Assam Wing; Lt. Ralph Madden, American New York reservations, passenger officer at a China station; Lt. Forest B. Lindley, Eastern field traffic, New York, assistant P&T officer at a China base; Lt. Elmer Bryant, TWA traffic Washington, passenger officer at an India base; Lt. Hilbert Hughes, Continental Air Lines, air freight officer, India base; Lt. Howard Grote, United, assistant priorities control officer; Lt. Randall Ward, United traffic San Francisco, assistant passenger officer, India base; M/Sgt. William Merchant, American New York reservations, NCO in charge of priorities, Assam Wing; T/Sgt. William C. Culpepper, Pan American Miami traffic, NCO assistant to priorities control officer; Sgt. Cecil Jennings, American, Knoxville, passenger traffic clerk; Sgt. George Miles, American New York reservations, chief clerk, priorities and traffic, Assam base.

Another well-known airline man is Maj. Lou Pimiam, Braniff's Chicago district traffic manager, now movement and control officer, Northern Air Service Area Command.

Deputy Commander of the India-China Division is Col. Temple Bowen, who operated Bowen Airlines in Texas in the late 30s.

Bengal-to-China Direct

The future plans of ICD cannot, naturally, be discussed. C-54s are in use in the division, and they have made possible direct air lift of supplies from Bengal to China—"dockside airports," as it were. This eliminates the long rail trip from the docks to Assam bases. Such dockside airports will further insure a continued flow of supplies to China. However, the C-46, which is proving itself on the Hump, will be retained. The C-47 will continue as a passenger-carrier, although not over the Hump. The four-engined cargo carriers which are converted bombers can be expected to be abandoned.

ICD's job of supplying China will increase as the tempo of the Japanese war increases—until an easier way can be found to supply China. The opening of the Stilwell Road does not make an appreciable difference in ICD's job.

A question often discussed here is the postwar future of the ICD operation. What of the miles of surfaced runways that have been built, the buildings, the weather stations, the airways facilities? Many ask the question, but no one answers it. Many are afraid we will lose the facilities.

The only statement that gives even a hint of the future is that contained in an ICD pamphlet: "The significance of ICD's share in building the Air Transport Command's globe-girdling airways system will not be fully apparent until after the war is won, when the Hump and ICD's other routes will take their places among all ATC's routes, airways of peace pioneered in war."

Regardless of the future, however, the job now being done by ICD is tremendous. It will continue to be tremendous until the Japanese are defeated.

Charles P. Taft Heads Three Divisions; Aviation is One

Charles P. Taft, as the new director of the Office of Transport and Communications Policy in the State Department, holds an important position in the overall transportation field.

At present, due to the fact that he has three divisions under his jurisdiction—Aviation, Shipping and Telecommunications, plus some major duties remaining from previous posts in the State Department, he is relying heavily on Stokeley W. Morgan, chief of the Aviation Division, to direct most of the aviation matters.

Taft

Within a month after Taft became director of the Office of Transportation and Communications the word "Policy" was added to the name of the office to denote that its function regards policy and not operations.

Taft, a Yale-educated Cincinnati lawyer, son of former President William Howard Taft and a brother of U. S. Senator Robert A. Taft of Ohio, has been interested in travel facilities since he went around the world twice before he was 10 years old.

Before assuming the new position April 1, he had been special assistant to W. L. Clayton, Assistant Secretary of State for Air. Previously he had been director, Community War Services, Federal Security Agency, 1941-42; director Wartime Economic Affairs, State Department, 1943-44; and a member of the President's War Relief Control Board since 1941.

Taft now is busy on problems of inland transportation in Europe to provide for carrying on rail and waterway traffic after military jurisdiction is relaxed. The pattern for this is being laid out now. These special duties are preventing Taft from exercising extended efforts in aviation. They have also prevented him from going to the United Nations Conference in San Francisco where he was assigned as a special adviser.

Plans Aviation Trades School

The New York City Board of Education has drawn up plans for the Wilbur Wright High School of Aviation Trades to be located adjacent to LaGuardia Airport.

Many Delegations To San Francisco Arrive by Plane

Members of 24 of the 46 national delegations to the San Francisco United Nations Conference on International Organization flew to this country as fare-paying pasengers in regularly scheduled passenger aircraft of the AAF Air Transport Command, the War Department reveals. The trips began around April 1 and continued to the opening date of the conference, April 25.

"Here is evidence," said Lieutenant General Harold L. George, commanding general of the Air Transport Command, "that air transport, so remarkably developed by this war, can become the medium of mutual understanding for all nations when peace comes. Distances between the world's capitals are measured now in hours. The leaders of nations can meet face to face and settle their differences by personal arbitration rather than by long range negotiations."

Delegations of the following nations were transported in whole or in part by Air Transport Command:

Belgium, Brazil, China, Czechoslovakia, Egypt, Ethiopia, France, Greece, India, Iran, Iraq, Lebanon, Liberia, Luxembourg, Netherlands, Norway, Philippine Commonwealth, Saudi Arabia, Syria, Turkey, Union of South Africa, Union of Soviet Socialist Republics, United Kingdom and Yugoslavia.

The Chinese delegation moved the greatest distance along ATC routes, from China via India and North Africa to the United States. The diplomatic passengers received standard ATC service for VIPs (very important persons) on regularly scheduled flights over normal routes.

Traveling in the modern passenger planes of the ATC, the various San Francisco-bound delegates of the United Nations were provided in-flight meals, hotel and mess accommodations at stopovers.

A number of women, mainly stenographers and code workers, were in the diplomatic parties arriving by air. The delegations carried hundreds of pounds of baggage, including documents, code books, and other working materials.

The world grew smaller in ATC planes when officials of as many as five different nations were company on single planes. Arrival ceremonies, mainly at La Guardia Field, New York, and Washington National Airport, were colorful as delegates were welcomed by American officials and foreign diplomatic representatives stationed in Washington.

The only delegates not traveling in ATC planes were those of South and Central American countries, who used commercial aviation facilities, the Australians and part of the British and French parties, who came by British air transport and surface vessels.

To Improve Milwaukee 'Port

The city council of Milwaukee has by resolution authorized an appropriation of $10,000 for improvements to Maitland Field, which will be utilized as a downtown airstrip.

Morgan Made Executive Director of Chamber

John E. P. Morgan, chairman of the Management Committee of the Aeronautical Chamber of Commerce, has been named executive director of the Chamber.

Morgan Boyle

As executive director, Morgan will supervise staff activities, serving under E. E. Wilson, president. Morgan joined the Chamber in January, 1944, as manager of the Personal Aircraft Council.

John K. Boyle, director of the Readjustment Service, was named assistant director. Boyle, who will continue his Readjustment Service work in addition to his new duties, joined the Chamber staff in September, 1944.

Emergency Equipment For Oceanic Flights To Be Standardized

Six manufacturing concerns and the Air-Sea Rescue Agency of the U. S. Coast Guard are working with a subcommittee of the Aircraft Requirements and Operations committees of the Air Transport Association in the development of standardized emergency equipment for over-ocean operations.

Some of the manufacturers are now in the process of building life rafts and complementary equipment upon which tests will be conducted sometime in June.

Manufacturers cooperating in the program are: B. F. Goodrich Co., U. S. Rubber Co., New York Rubber Co., Goodyear Tire and Rubber Co., Air Cruisers, Inc. and Republic Aviation Corp. Representatives of the Civil Aeronautics Administration also met with the committee when various proposals were discussed.

It was learned from one of the members of the subcommittee that the committee will draw heavily on the experiences of the military in connection with its over-sea transport operations in adopting a standard type of equipment. Considerable discussion centered about the size and the number of rafts that are necessary in relation to the passenger-carrying capacity of airplanes now in existence and those to be built in the future. The nature and type of accessories, from flares to radio equipment and emergency rations, also was discussed.

The subcommittee, headed by William H. Hall, Division Engineer-Trans-Atlantic, American Airlines, Inc., is to draft recommendations to the full Aircraft Requirements committee which will embody suggestions for incorporating changes in the design of new planes so that the equipment may be assured of its maximum utilization in time of emergency.

AAF Plans Release Of Some Pilots to Commercial Airlines

The Army Air Forces has initiated a policy providing for the release of a limited number of military pilots from active duty to take up pilot duties with the commercial airlines. The move is based on the fact that the airlines are being allocated additional aircraft with which to inaugurate new services which the AAF believes essential to the war effort. Additional pilot personnel is required to establish these services.

Releases will be limited to pilots who have completed a tour of duty overseas and who have been on duty in this country for a period of six months since the foreign assignment. Pilots and co-pilots will be released only for flying assignments with a specific airline, and are subject to being recalled to duty by the AAF if they terminate such employment.

Gen. H. H. Arnold emphasized in a letter outlining the new procedure that under no circumstances would military pilot personnel be released outright from the AAF for civilian pilot work with the airlines. They will be placed on inactive status, subject to recall to duty at any time their services are again required by the military.

Military pilots who desire assignment with the airlines may make application to the AAF's ACAS Personnel, Military Personnel Division, Demobilization and Personnel Readjustment Branch, Washington, D. C. Before release will be granted, the pilot-applicant must meet certain physical and flying requirements and must have completed hiring arrangements with an airline. The latter point must be supported by a letter from the airline.

Spot Authorization Plan Reinstated by Krug

The spot authorization plan for filling gaps caused by terminated war contracts has been reinstated by J. A. Krug, chairman of the War Production Board, "to adjust policies and controls to the changing military procurement programs of the Army Air Forces and other military agencies."

The plan permits district and regional offices of WPB to authorize civilian production in any Labor Area regardless of its degree of labor shortage. Idle and excess stocks of controlled materials may be used for this civilian production. In addition, Controlled Materials Plan will be open-ended when conditions permit, with the result that the spot authorization will become less important as a method of authorizing production, WPB announces. The open-ending of CMP will mean that all copper, steel, and aluminum not scheduled for war production will be placed on the open market.

Lewis Named NAS Director

George W. Lewis, director of aeronautical research for the National Advisory Committee for Aeronautics, has been elected a member of the National Academy of Science.

Now and Tomorrow...

GENERAL AVIATION DISTRIBUTORS BRING PRIVATE FLYING A BRIGHTER FUTURE

● Few factors are building more surely toward the successful expansion of nation-wide private flying than the progressive service standards being encouraged at airports where General Airplane Tires and products are handled. For flyers have *confidence* that where Top-Quality GENERALS are sold, ground service and facilities are *best*, also.

General's Aviation Distributors select airport retailers by strictest service standards . . . and because comprehensive Distributors' stocks eliminate the need for costly airport stocks . . . fixed-base operators' funds are released for adequate service expansion.

This policy is supported even during wartime by complete, strategically located distributor stocks . . . coast-to-coast . . . and the ground service system, which General is helping to build, promises the new flying public of tomorrow airport facilities matching the famous quality and safety of The General Tire.

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The GENERAL AIRPLANE TIRE

KNOWN ROUND THE WORLD FOR QUALITY AND SAFETY

CAA Awards Mechanic's License to Woman

One of the first CAA Aircraft and Engine Mechanic's Licenses to be given to a woman has been awarded Joan Van Maltzahn. Wife of a dentist in the U. S. Public Health Service, Mrs. Maltzahn has

Joan Van Maltzahn

studied for the license for two years and is now working as chief mechanic at the Cool Meadow Airport, Lexington, Kentucky.

She started studying engines and planes two years ago at the Academy of Aeronautics, La Guardia Field, New York, under the Army Air Forces training program, worked as a junior mechanic for American Airlines and for the War Training Service program at Lexington, Ky. For experience on larger radial engines she worked at the Aeronautical Research Laboratory of the University of Kentucky.

"Every licensed mechanic should have at least a student pilot's license," Mrs. Maltzahn says. "Flying will make him understand the mechanics of flight better, the loads and stresses imposed on all parts of the ship as well as the engine."

She has a pilot's license and her own plane. Before she began her work for the license, she graduated from Bryn Mawr College and Columbia University.

Sumner Sewall Heads AMEX Succeeding W. H. Coverdale

(Picture on Page 1)

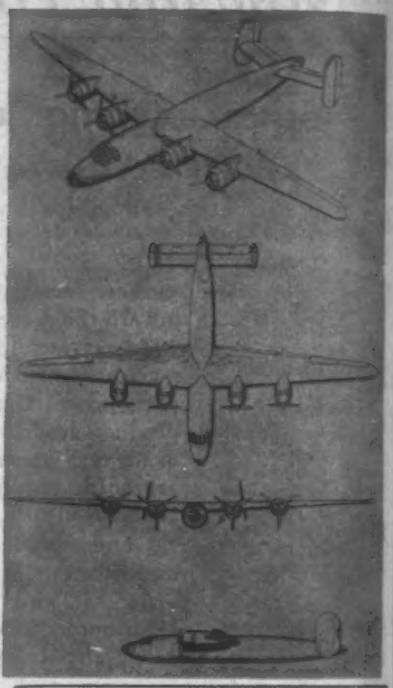
Sumner Sewall, former governor of Maine, has been elected president and a director of American Export Airlines. He succeeds W. H. Coverdale as president, but the latter will remain with AMEX as a director. John E. Slater, executive vice president since the company was organized eight years ago, has been named chairman of the board.

Sewall was a fighter pilot in World War I, earning the rating of an ace. He was formerly traffic manager of Colonial Airlines and subsequently general traffic manager of the system which became American Airlines. For the last 11 years he has been a director of United Air Lines, a post he recently resigned.

Design Patent on Four-Engined High-Wing Plane Given Convair

A DESIGN PATENT for a four-engine high-wing plane, which appears to be planned for high performance operation, has been granted to Henry A. Sutton, director of engineering for Consolidated Vultee Aircraft Corp., and assigned by him to Convair, according to the April 17 issue of the Official Gazette of the United States Patent Office. The term of the patent is 14 years.

Drawings of the new plane as they appeared in the Patent Office Gazette are shown at right. The nacelles appear to be designed for turbo-supercharged engines with jet thrust. Sutton filed his application for the patent June 19, 1944.



All American Aviation Has 6th Anniversary

All American Aviation, Inc., the unique airline which was established as an experiment authorized by Congress in an effort to find a practical way to extend air mail service to communities off the main air transport system, was six years old May 12.

Bazley

In six years All American has grown from two experimental routes 1,040 miles long which served 56 communities, to a system of five routes extending 1,568 miles and serving 118 communities on schedules requiring 5,068 miles of flying every day.

The Air Pick-Up planes in the past year flew 1,296,472 revenue miles making the six-year total 5,166,434 miles to which should be added another million miles flown by the company's military cargo planes before the service was terminated. During the year 70,488 pick-ups and deliveries were made for a grand total of 295,609. Mail transported amounted to 954,000 pounds; air express 181,000 pounds.

The mail volume represented an increase of 71 per cent over the previous year. Air express traffic was up 11 per cent. This increase would have been larger if growing mail loads had not precluded development of the traffic, according to Halsey R. Bazley, president of the company.

"The Air Pick-Up service," Bazley said, "is not costing the government a cent. We emerged from the subsidy class three years ago, and the Post Office Department is now making a substantial profit on the service. Air mail dispatched via Air Pick-Up last year produced estimated postal revenues of $1,915,000 as compared with $534,000 mail pay received by the company. In six years the postal revenues from mail dispatched by Air Pick-Up have amounted to $3,875,245, while our mail pay for the same period was $2,416,069."

Airlines May Get 49s by February

Lockheed Aircraft Corp. hopes to start deliveries of its Model 49, the commercial airlines version of the Constellation, by the end of February, 1946, provided war orders have been met and government permission obtained. Lockheed engineers presented a new 100,000-pound version of the Constellation to the airlines last fall, and the company hopes permission can be secured to advance production on this version, which is designated as the Model 549. Subject to the required approvals, schedules for the C-69 military transport version of the Constellation will be increased to complete present Army contracts by February instead of July, 1946.

Under the new schedules, effective immediately, there will be no change in the recently revised B-17 program. P-38 production will terminate in November rather than December, 1945, in order to allow the Nashville division of Consolidated Vultee Aircraft Co. to taper its P-38 production more gradually. P-80 production will accelerate as scheduled during 1945, but will reach its peak in February, 1946, and remain at that level instead of further accelerating as previously planned. PV Navy bomber production will be tapered gradually until orders are filled sometime in 1946. All other Navy projects will continue without important changes through 1946.

2500 Additional Deferments

The Office of Defense Transportation has been authorized to grant 2500 deferments in transportation in addition to the 30% originally allowed for essential employes between the ages of 18 and 29.

Standard Equipment
Tricycle Landing Gear
Simplified Operation
Guaranteed Spin-Proof
Exceptionally Maneuverable
Performance with Safety

the certified spin-proof plane

ERCOUPE

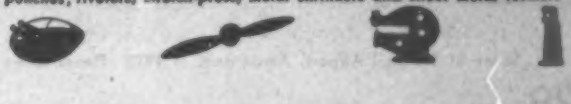
Full Load Weights and Performance Data

ENGINE	65 horsepower
EMPTY WEIGHT	725 lbs.
USEFUL LOAD: Pilot	170 lbs.
Passenger	170 lbs.
Fuel—23 gal. @ 6 lbs.	138 lbs.
Oil—1 gal.	7 lbs.
Baggage	50 lbs. (Total 535 lbs.)
GROSS WEIGHT	1260 lbs
FUEL MILEAGE	23 mi. per gal.
CRUISING RANGE—Maximum	525 miles
CRUISING SPEED	105 M.P.H.
MAXIMUM SPEED	117 M.P.H.
RATE OF CLIMB—Sea Level, First Minute	700 feet
MAXIMUM PRACTICAL ALTITUDE OF FLIGHT	13,000 feet

You won't have to wait for improvements in personal planes—they'll be waiting for you in the post-war Ercoupe

ENGINEERING AND RESEARCH CORPORATION • Riverdale, Maryland

Makers of gun-turrets for Navy bombers, propeller-profilers, automatic punches, riveters, stretch-press, metal shrinkers and sheet metal formers



K. L. M. Completes 25 Years of Operations; Wartime Performance Notable

ON MAY 17, 1920, a small dot appeared in the blue spring sky over Schiphol Airfield, Amsterdam. A few minutes later, the sound of a 240 hp, six-cylinder Sidderley Puma engine thundered close overhead and a military de Havilland DH-9, converted into a transport, ripped its tail-skid through the airport's turf. The plane, flying from London's Croydon Airport in three hours, had just completed the inaugural flight of K. L. M. Royal Dutch Airlines' international services, which have continued without interruption for 25 years.

Plesman

For the first two months, a K. L. M. DH-9 flew from Amsterdam to London every other day, often filled to capacity with two passengers uncomfortably seated in the enlarged observers' compartment. By July, the service was flown daily. By September, K. L. M. acquired its first commercial aircraft designed as such—a Fokker F-2—and daily service was started from Amsterdam to Hamburg and Copenhagen.

In the spring of 1921, a number of Fokker F-3, five-passenger monoplanes were added to K. L. M.'s fleet. From then on, hardly a year in the history of the airline has passed without new and outstanding achievements. Some of these were:

1921—Opened the world's first air traffic booking office in Amsterdam.

1925—Introduced the 8-seat Fokker F.VIIa, powered by a Bristol Jupiter VI 480 hp engine, the first air-cooled engine to be used by a transport company.

1930—Inaugurated regular fortnightly service between Holland and Java, using an 8-seat Fokker F.VIIb, powered with three Titan 250 hp engines.

1933—K. L. M.'s Fokker F.XVIII PH-AIP, with three Pratt and Whitney Wasp C 420 hp engines, made a record-breaking mail flight from Amsterdam to Batavia in 4 days, 4 hours, and 40 minutes.

1934—Introduced the first Douglas DC-2 to Europe; flew mail in a Fokker F.XVIII from Amsterdam to Curacao, Dutch West Indies, a total of 6,390 miles (this flight, via Marseilles, Casablanca, Porta Praia, and Paramaribo, included the first mid-Atlantic hop in history; the distance over the ocean from Porta Praia to Paramaribo was 2,286 miles, far beyond the normal range of any transport plane in those days.)

1935—Opened first regular service between Curacao and Aruba in the Dutch West Indies, the beginning of a large international airnet in the Caribbean, which now flies more than 1½ million miles yearly.

K.L.M. was using 36-passenger, four-engined Fokker F-36s by 1935.

1938—K. N. I. L. M. (Royal Netherlands Indies' Airways, a subsidiary) extended its route to Australia, thus creating a connection from Amsterdam through to Sydney, the total journey taking eight days, the fastest regular connection between Holland (or England) and Australia.

1939—Operated regular air service to 34 countries, with a total fleet of 46 airliners, including Fokker F.XVIII and F.XXII, Douglas DC-2, DC-3 and DC-5, and Lockheed 14 planes.

When Holland was invaded in May, 1940, K. L. M. flew out five DC-3s and one DC-2 and based them in England. Twenty Douglas planes were lost as a result of German attacks on Netherlands air bases. Within a few weeks, however, K. L. M. had started a daily service to Lisbon. With extra fuel tanks, the planes flew a course which took them over about 1000 miles of the Atlantic, always in range of German aircraft. The Lisbon service, in spite of some losses through enemy action, has been operated without a break. Since July, 1940, planes on this run have made more than 3000 flights.

At the start of hostilities in Europe, the western terminal of the Amsterdam-Batavia line was first shifted to Naples and, after the war spread out over the Mediterranean, it was transferred to Lydda, in Palestine. From that station the connection with Batavia was maintained with difficulty, until the fall of the Netherlands Indies. K. L. M. equipment intact at that time was flown to Australia, evacuating scores of civilians and military people.

K. L. M.'s network in the Western hemisphere, as of December 31, 1942, had extended to 3128 route miles, connecting Curacao (the main base in the West Indies) with the other Dutch islands in the Caribbean and the Dutch territory of Surinam, as well as with Colombia, Venezuela, Trinidad, the Dominican Republic, Haiti, Jamaica, and Cuba.

One of K. L. M.'s most important extensions in the Caribbean occurred in August, 1943, when the connection between Curacao and Miami was inaugurated after the Civil Aeronautics Board had invited domestic and foreign air carriers to come in to relieve the congestion of traffic from Miami to the West Indies and South America. When, in 1944, regular service was extended to the tiny island of St. Maarten, in the far northeastern corner of the Caribbean, K. L. M.

Scene at Schiphol Airport, Amsterdam, in 1938. Planes shown are Douglas DC-3s.

Stewardess Anniversary

United Air Lines is celebrating May 15 the 15th anniversary of its stewardess service.

The girl who conceived the idea was Ellen Church, now a captain in the Army Nurse Corps, Air Evacuation Service. With seven other girls she formed the nucleus of a profession which since has spread to airlines throughout the United States and a dozen foreign countries. United now has more than 250 stewardesses.

Outside it's 80° below freezing!...

THIRTY THOUSAND feet below fires burn on German soil . . . Six miles up in the air, the navigator gets a terse command from the pilot to set the course for home!

If this plane is to get home, the delicate engineering, flight and navigation instruments *must* be accurate . . . accurate at ground level, and at 30,000 feet . . . accurate at 150 degrees above and at 50 degrees below.

A QUICK PICTURE
of Esso Aviation Instrument Oil

Saybolt universal viscosity	
34.6 seconds at	210° F.
986 seconds at	0° F.
Viscosity index	70
Pour Point	−60° F.

YOU CAN DEPEND ON

***A THIN FILM** of Esso Aviation Instrument oil helps to keep these delicate instruments working accurately over more than a 200 degree temperature range! Developed by Esso engineers working with leading aircraft instrument manufacturers for some time, this is the instrument oil acceptable under Army-Navy Specification AN-O-4 . . . This rust-resistant oil is recommended for use in speed reducing units of Curtiss electric propellers, and has been used with marked success in applications of all sorts where high-speed bearings under light load must operate at wide temperature ranges.*

By 1940, fresh vegetables were being shipped from Holland to London in Fokker F-7s, which K. L. M. refitted as cargo planes.

route mileage in that area reached the total of 5180.

Recently the airline has been allocated four surplus Douglas DC-3 planes from the U. S. government. Arrangements are being made for the purchase, in the United States, of four-engined equipment with which K. L. M. hopes to compete in world aviation.

Founder and present managing director of K. L. M. is Albert Plesman, who was one of the small group of high-collared men, in bowler hats, on hand 25 years ago when the airline's first plane arrived in Amsterdam from London.

Non-Profit Company To Handle Purchases For Foreign Airlines

The Air Carrier & Supply Corp., a Delaware corporation established on a non-profit basis, has been oragnized with headquarters at 1108 16th St., N. W., Washington, to represent foreign airlines in their equipment purchases; and has already completed negotiations to represent two Brazilian airlines, Servicos Aereo Cruzeiro do Sul, and Empresa de Viacao Aerea Rio Grandense (VARIG).

Heading the new company as president is F. L. Duncan, formerly with American and Colonial, and more recently head of a U. S. technical mission for the Defense Supply Corp. to aid in the development of the Cruzeiro line in Brazil, who will actively supervise the management, but will also serve individually as a technical consultant for airlines. George Porter, for 18 years a purchasing official of Pan American Airways, is secretary; and E. P. Odenwalder, formerly treasurer of Colonial Airlines, is treasurer.

Air Carrier & Supply Corp. will be a purchasing agent for foreign air carriers, and in this capacity will make purchases from U. S. suppliers and manufacturers of aircraft and aircraft equipment, parts, materials and supplies; arrange for inspection, handling, warehousing storage, shipping, insurance and similar items, the preparation of necessary shipping and other documents, and the obtaining of necessary export licenses; and endeavor to obtain the best possible price on all materials puchased. The company will try to obtain all factual technical data available concerning American manufactured aircraft and equipment, but will assume no responsibility or obligation to make recommendations or give advice on technical or organizational problems.

The company will be the representative of the carriers with which it has agreements, and not of the manufacturers from whom the purchases are made. In return for such services, each carrier will make an annual advance payment ranging from $5,000 if its total seating capacity is less than 50 to $20,000 if its total seating capacity is 100 or more. Additional payments shall be made based on a percentage of the aggregate purchase price of purchases made by the carrier less a credit equal to the annual payment. These payments will be at rate of five percent on the first $300.000 of purchases in any one year, and three percent for all subsequent purchases in that year.

Refunds at Year's End

At the end of each year the carriers will be given refunds amounting to 85 percent of the amount by which the aggregate of all annual payments and percentage payments exceeds the aggregate of the company's operating and other expenses and reserves for bad debts, contingencies, deferred charges and similar items. The refund to each carrier will amount to the sum by which its percentage payments do not equal its annual payment, provided there is a sufficient amount to be so distributed in full to each carrier. If the amount to be distributed is not sufficient to permit full refund on this basis, then each carrier will receive a refund proportionate to the sum by which its annual payment exceeds its percentage payments in relation to the aggregate by which all annual payments exceed all percentage payments.

If any of the 85 percent remains after full refund has been made on the above basis, it will be distributed to each carrier in proportion according to the relationship of its purchases to total purchases of all carriers represented.

Frozen Food Service, Tested by NATS, May Be Used by Airlines

A new method of food preparation and handling which is expected to provide airlines with a means of quick, compact and convenient meal service free from many of the problems now encountered has been announced by Maxson Food Systems, a division of the W. L. Maxson Corp.

The new system makes use of quick frozen partially pre-cooked meals which are stored in the frozen state until needed and then cooked in a specially designed oven for a brief period before serving. It has been tested by the Naval Air Transport Service and will reportedly be used on the new Navy Mars flying boats soon to be delivered by the Glenn L. Martin Co.

The Maxson system consists of three parts—the specially prepared quick-frozen meals, a Sky Chef Storage Cabinet and the Maxson Whirlwind Oven for the final cooking period. In preparing the meals each food is cooked individually for a different length of time so that the remaining portion of the cooking period will be identical for everything. The partially pre-cooked foods are then packaged on plates as complete dinners, quick frozen and stored in normal deep freeze units at the airport or base.

Airborne equipment consists of the Sky Chef Storage Cabinet, which is a permanent installation in the plane, and contains the Whirlwind Oven in addition to storage space for the frozen dinners. It is approximately 71 inches long, 35 inches high and from 26 to 32 inches deep. No refrigeration unit is needed as the storage compartments are lined with ferrotherm metal capable of keeping the meals cold more than 60 hours.

The present airborne model of the Whirlwind Oven is a stainless steel unit 14 inches wide, 19 inches high, 20 inches deep, and weighing about 35 pounds. It operates from the plane's standard 24-volt electrical system, and has a capacity of six meals. Each meal or plate is placed on a specially arranged rack within the oven and a high speed motor driven fan within the oven distributes the hot air evenly over the surfaces of all plates so as to preclude the drying of the various foods during cooking. The company points out that the short final cooking period is not a warming process, but an actual thorough final cooking. All meals are prepared on special disposable plates which may be discarded after the meal is eaten.

In a test with the Naval Air Transport Service, 180 meals were placed aboard a Navy plane on a flight of 13,000 miles. The test was so successful that the Navy placed a substantial contract. While all production is at present going to the armed services, the system is now being studied by several domestic airlines.

Inter-American Meeting Postponed

The Brazilian Government has postponed the proposed Inter-American Telecommunications Conference scheduled for June 1 in Rio de Janeiro to Sept. 2 in order to eliminate conflict with the current San Francisco security conference.

Sets New Standards for DEPENDABILITY *and* ECONOMY

FLYING Curtiss Commandos 10,000,000 miles, largely over water to South America and Africa, Eastern Air Line pilots, operating for Air Transport Command, never missed a scheduled flight because of adverse weather conditions.

That's equal to 400,000,000 passenger miles, but it is only a small portion of the tough war mileage which has tested and proven the Curtiss Commando to make it the most advanced transport available for peacetime air fleets of the world.

World's largest and fastest twin-engine passenger-cargo airplane, the Commando will seat from 36-42 passengers, yet have 526 cubic feet of cargo space to accommodate anticipated 1400% increase over the prewar level in mail and cargo during the immediate postwar years.

With its twin-engine economy, the Commando will produce profits when flying with far less than maximum payload—show greatly accelerated revenue as payloads approach or attain full capacity—is the most economical airplane to operate on flights whose range accounts for more than 90% of all domestic air travel. Curtiss-Wright Corporation, Airplane Division.

Curtiss Commando

Passed the toughest tests ever given a Transport Plane

LIKE SLIDING DOWN A SUNBEAM

As your big skyliner touches the runway, that easy shift from air to earth is typical of all TWA-ing—a smooth and skillful thing. For like the good food we seek to provide, the courtesy for which TWA Hostesses are famous, the care with which each TWA flight is planned—happy landings for today's essential travelers are mighty important to us. Only when they are like "sliding down a sunbeam" do they fully measure up to what we always aim to give you.

Base Map © R. McN. Co.

TWA
POINTS THE WAY

Don't travel unless your trip helps win the war

Senator Burton Comes Out Against 'Single Company'

Trippe Charges Damon With 'Inaccuracies' Before Senate Group

AVIATION SUBCOMMITTEE hearings on the McCarran All American Flag Line bill were completed in the Senate May 4 with rebuttal testimony by Juan T. Trippe, president of Pan American Airways. It was expected that the full Senate Commerce committee would receive a report on the bill around the middle of the month after which a vote would be taken as to whether the bill should be reported out.

The aviation subcommittee line-up on the bill may have swung definitely against the single company idea May 2 as a result of a statement by Sen. Harold H. Burton (R., Ohio) that, in his opinion, aviation is in its infancy and the long range interest of the U. S. will best be served by developing the industry and stimulating competition between aircraft manufacturers and engineers. It was generally believed that the subcommittee of 11 men stood five for and five against the bill, with Chairman Josiah W. Bailey's position undetermined. Sen. Burton previously had been reported as one of those favoring the single company plan.

Trippe, called back to explain the wide differential between Pan American operating costs and those of the domestic airlines, charged that the comparisons made by Ralph S. Damon, vice-president and general manager of American Airlines were "inaccurate and misleading."

Trippe told the Aviation subcommittee that advocates of competition in international transport showed "a lack of appreciation of the grave dangers that confront the U. S. with our high labor costs . . . on all world trade routes."

Trippe told the subcommittee that the domestic airlines' comparisons of costs were unfair for two basic reasons: they had failed to take into account their greater frequency of operation and greater density of traffic and had ignored the many facilities which Pan Am had to build and maintain abroad such as airports, radio stations, navigational aids and weather reporting systems but which are provided for the domestic lines by the Federal Government.

Trippe Introduces a Chart

Criticizing the chart presented by Damon comparing costs per plane mile between Pan American's Western Division and American Airlines domestic service, Trippe introduced a similar chart comparing costs per route mile of $1.52 for the Western Division and $3.77 for American in 1940. "A comparison of cost per route mile, which does not take account of the fact that volume increases costs per mile of route, is no more unfair than a comparison which fails to take into account that low frequency increases costs per plane mile," Trippe said.

Trippe pointed out that in stating Pan America's costs were $1.93 per revenue ton mile for the 12 months ending Nov. 30, 1941 compared to 61.5c for the domestic airlines, the domestic airlines had neglected to state they were including not only Pan American's Latin American and Alaskan services but also the transatlantic and transpacific operations, accounting for 40% of the total operations, which are conducted with four-engine flying boats. In addition the CAB statistics from which the chart was drawn do not include any mail or express pay load flown which is represented by foreign mail and excess baggage so that they have arrived at "a ton mile figure in spite of the plain warnings in the report from which they were working that to do this would be dividing all of our costs by only a part of the traffic carried," Trippe said.

The statement that if American Airlines had operated its Texas to Mexico City route in 1940 its costs would have been 60.6c compared to Pan Am's 175.8c is "bound to mislead," Trippe asserted. Practically 100% of the Western Division is foreign since these figures include the whole route from Brownsville to Port-of-Spain while one-third of American's route to Mexico City is over free Federal airways. He said in its accounting American gave a "free ride" to the Mexico City service at El Paso and Ft. Worth, two of the four stops on the route, since it was only charged with a pro rata share of the total expense. He added that Pan Am contributed $150,000 to build the Mexico City airport while American contributed nothing.

Only Two-thirds as High

He said that Pan American traffic and sales costs can only be properly compared with similar costs of international steamship services since they must include all foreign travel requirements such as passports, visas, police and health certificates, while reservation procedures are more expensive with the requirements of cable and radio communications costs. Pan Am traffic and sales costs, according to Trippe are only two-thirds as high as the larger U. S. flag steamship companies.

The Pan Am president said he was "surprised, to say the least," that American had spent only $65,000 for advertising and publicity on its Mexico service in 1943 when a check revealed that "32% of American's entire system newspaper campaign alone in the U. S. for an average month in 1943 was devoted to advertising featuring their Mexico City service." He said inquiries revealed the $65,000 represented only expenses for advertising in Mexico.

If the Western Division had operated an average of four trips daily instead of less than one (making it comparable to the domestic airlines) executive and general expenses would have been comparable even though Pan Am was operating in 10 foreign countries, Trippe asserted.

He said that the only fair comparison between Pan American and the domestic lines was in their contract services for the Army and Navy where they were all "operating under generally similar conditions," on transatlantic service using four-engine planes. He suggested the Air Transport Command might be willing to submit the restricted statistics on these operations to the committee.

He said the domestic airlines claim 3,000,000,000 passenger miles would be too much for any one airline to handle, which is "strange when you think of what they want for themselves." He said that if American regains its 1941 position of carrying 30% of the domestic air traffic, is granted control of American Export and its applications across the North and South Atlantic are granted, its system passenger miles would amount to 4,953,000,000 per annum whereas all the rest of the overseas and international air passenger miles would be only 2,346,000,000.

Trippe gave the committee an affidavit crediting Pan Am with sponsoring the development of the Sikorsky 42 Flying Boat, the twin-engine Lockheed Electra Model 10, the Boeing 314 Flying Boat, the Boeing 307 4-engine landplane, the Sikorsky 4-engine Excaliber 44, Lockheed Constellation Models 49 and 149 and the Lockheed L-89. "All do better than 150 miles per hour," he stated, attacking the contention of Jack Frye, president of TWA, that the domestic airlines were responsible for all aircraft in this country with a cruising speed of more than 150 mph.

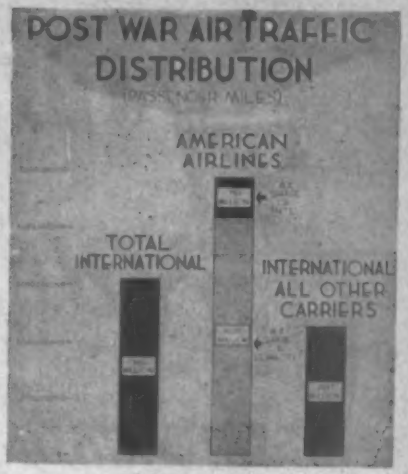


Exhibit at Hearing

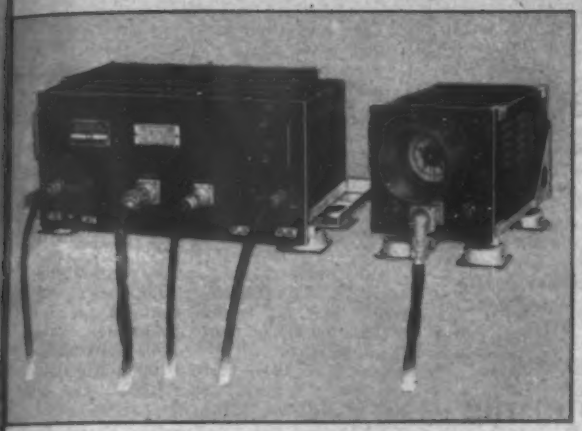
Hearing Date on Lea Bill Moved Back 2 Weeks More

The tentative hearing date on the Lea Bill (H. R. 674) which would reconstitute the Civil Aeronautics Administration as an independent agency of the government and provide for a Federal-Aid Airport program, has been moved back for a least another two weeks. Sources close to its author, Rep. Clarence F. Lea (D., Calif.) chairman of the House Interstate and Foreign Commerce committee, stated hearings were to start around May 15.

Thus it appeared that House of Representatives action on aviation legislation could not be expected before late in June, possibly not until July. Further delays might develop if progress on the war fronts was such that Congress decided to vote itself the first extended summer vacation since before 1941.

RADIO ALTIMETERS DESIGNED by RCA

safeguard the planes that fly the "hump"



RCA Radio Altimeters are used

on all the global routes

of the Air Transport Command

FOR the past three years, the Air Transport Command has supplied the American Air Forces in China by flying supplies over the 20,000-foot peaks of the snow-clad Himalaya Mountains. This flying route with its 100-mile winds, severe downdrafts and cloud-hidden peaks is one of the most dangerous in the world —yet as high as three hundred trips a day must be made over it.

One of the instruments that help to maintain this ATC schedule is the high-altitude model of the RCA family of Radio Altimeters. This altimeter indicates the plane's clearance over cloud-hidden peaks and tells the pilots of the Air Transport Command when it is safe to let down through the overcast.

Thus, once again, RCA Research has made a major contribution to the safety of flying—a contribution that will be equally important in postwar commercial airline service. Remember, "When you think of Radio Altimeters, think of RCA."

Buy More War Bonds

RCA

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION • CAMDEN, N. J.

Federal-Aid Airport Bill Debated In Senate; Some Compromises Made

THE McCARRAN Federal-Aid airport bill which proposes to raise $500,000,000 in Federal funds for airport construction during the five postwar years to be matched by a similar amount from the States, was scheduled for Senate debate as this issue went to press.

This bill, a revised version of S.2, was reported to the Senate by the Commerce Committee April 30 after a special committee, headed by Sen. Pat McCarran (D., Nev.) had amended the original bill so as to incorporate some of the recommendations made by a score of witnesses. The special committee also made changes in S.2 which were designed to compromise the differences between large city mayors and the Governors' Conference as to the levels at which the dual program is to be administered.

The mayors, led by Fiorella LaGuardia, of New York, had recommended that the entire program be administered at the urban level, under procedures somewhat similar to those in effect when the public works program was being carried on by the Federal Works Agency. The governors had recommended that all monies be funnelled through state aviation agencies in the interests of a correlated Federal-State airport program.

McCarran's original bill placed Class I and II airports in the State group and III, IV, V, VI and larger in the urban program, with the larger city airport projects slated to receive 50% of the funds. Under the compromise effected in the revised bill, Class I, II and III airports will come under the State program, and but 35% of the funds available shall be allocated to the Urban program.

Amendment by Robertson

The Commerce committee incorporated an amendment by Sen. Edward V. Robertson (R., Wyo.) which provides for a special matching formula for 11 states which have more than five percent of their area in public domain. Otherwise the allocation of funds to States is on an area and population basis, with the other 37 states matching Federal funds on a 50-50 basis.

Also included in the bill is a $3,000,000 appropriation for preliminary planning and surveys preparatory to the commencement of the program. Under labor provisions of the bill, a contractor who has been engaged to build the airport, may bring key personnel with him and the provision that he must hire labor from the county in which the project is located has been changed to make labor recruitment possible on a state-wide basis. Veterans preference is provided in the bill.

Under the terms of the bill, the Civil Aeronautics Administrator is to prepare an annual program for the development of airports in urban areas and an annual program for development of small airports on a statewide basis.

While it is generally agreed on Capitol Hill that a Federal-Aid airport bill will be passed quickly by the Senate, it is expected that the municipalities will renew their fight to have the entire program administered at the urban level. Because Congress has followed this procedure quite extensively in public works legislation, it is believed this attempt to modify the bill will find considerable support.

Sen. Edwin C. Johnson (D., Calif.) will offer amendments which will enable States and Municipalities to receive credit for money expended on airport projects since Jan. 1, 1945 if they meet with the standards outlined in the bill. The bill, as submitted to the Senate, will give States three years to pass legislation setting up responsible aviation agencies to handle the airport development program.

Minnesota Passes Measure Opposing Multiple Taxation

The legislature of Minnesota has passed a bill to eliminate the possibility of future multiple taxation of airline flight equipment in Minnesota. The bill became a law last fortnight when Gov. Edward J. Thye affixed his signature.

Under the provisions of the bill, a formula is prescribed for allocating to the various states the percentage of the tax that each state shall receive from the assessment of airline equipment operating within their borders from a base in another state.

The U. S. Supreme Court last year upheld the Minnesota Supreme Court in ruling that Ramsey County, in which St. Paul is located and where Northwest Airlines maintains its headquarters, was within the law in taxing Northwest's airline fleet 100% although the flight equipment was used in other states and thereby might become subject to multiple taxation. The new Minnesota Act obviously is to remedy this situation. Under the application of the formula, it is understood Northwest would pay only 32% of the flight equipment tax to Minnesota.

This multiple tax situation was considered such a threat to the economic stability of the airlines that Congress ordered the Civil Aeronautics Board to make a thorough study of the question and report its recommendations. This report was recently filed with Congress and if recommendations are adopted, Federal legislation remedying the overall condition will be passed.

The airline industry, in the meantime, is greatly heartened by Minnesota's action because of the possible wholesome effect it would have on the thinking of taxing authorities in other states.

Heads Surplus Disposal

Thomas B. McCabe has assumed active direction of the Army-Navy overseas surplus property disposal program as commissioner of the Office of Army-Navy Liquidation. McCabe is on leave from duty as chairman of the Federal Reserve Bank of Philadelphia and president of Scott Paper Co.

Beauty and the Public

Chicago and Southern Air Lines has retained a beauty specialist, Betty Coy, to give a course in beauty, style and poise to stewardesses and other employes who contact the public. The service is described as "re-styling the employe to fit the industry."

Naval Appropriation Bill Contains 122 Million For Radio, Radar Equipment

The Senate had under consideration early in May the Navy Department Appropriation bill which contains an item of $122,100,000 for radio and radar equipment, much of which will be used in airplanes. In 1945, there was appropriated for this equipment $66,420,200. The bill has passed the House.

In his testimony before the House Appropriations committee, Rear Admiral D. C. Ramsey, Chief, Bureau of Aeronautics, stated in regard to the item for radio and radar equipment: "There is no more important item in the entire 1946 estimate of this Bureau."

The breakdown of the various items under the heading of "Radio and Radar Equipment" was given as follows:

Radio countermeasure equipment	$30,000,000
Radar equipment:	
(a) Radar search equipment ..	2,500,000
(b) Radar bombing and gunlaying aids	10,400,000
(c) Radar interception equipment	1,300,000
(d) Special radar applications..	1,300,000
Identification equipment	36,100,000
Airborne beacons	3,000,000
Navigation aids	900,000
Communication accessories	1,100,000
Communications equipment	30,000,000
Mockups, special tests, etc.	100,000
Airborne lighting equipment	2,600,000
Rotating power supply equipment	2,800,000
Total	$122,100,000

Truman Recommends Cuts For Three Agencies

President Truman recommended last fortnight that appropriations for three governmental agencies having a close relation to aviation be reduced. The recommendations were as follows:

War Production Board—A reduction of $6,894,000 in the 1946 budget of $48,042,000, anticipating the removal of numerous control orders over material.

War Manpower Commission—A cut of $1,598,000 from the proposed 1946 figure of $15,598,000 for general administration, involving the abandonment of labor control in some areas. Minor reductions also were recommended for the apprenticeship training service and the training-within-industry service, and $1,600,000 was recommended to finance the migration of workers, compared with the original figure of $9,340,900.

Office of Scientific Research and Development—A $13,200,000 reduction in the 1946 budget of $90,700,000. This reduction was recommended on the contemplation that the office will terminate contracts for research that cannot be completed in time to help the war effort.

The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS"
·Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.

THE FOLLOWING WAS CLASSIFIED AS TOP SECRET!

But in line with our policy of keeping Perch Pilots the best informed group in Aviation, we got permission to break security and tell all.

It's about that new su-hooper, 6-engine Consolidated Vultee job which will weigh 320,000 pounds, have a-wing span equal to the height of a 21-story building, and an overall length to match!

Here's the inside story:

This plane is to have at least 2 navigators! There will be one in the nose and one in the tail! You see, the plane's so long, that it will be necessary to file two ETA's . . . one for each end of the ship!

Sh-h-h!

**THE BIGGER THEY ARE—
THE FARTHER THEY HAUL!**

But wait . . .

Before you can make planes as big as the one we just told you about, you've gotta make engines "big" enough in performance to lift 'em!

And before you can make engines that'll give you that kind of performance, you've got to have a thousand other things that will live up to the high performance standards of the engine—high performance spark plugs, pistons, metal alloys.

And of course you have to have high performance fuels and lubricants! Like that Gulf Aviation Gasoline and Gulfpride Oil.

Gulfpride is the only oil refined by the Alchlor Process, which is an extra step in extracting the trouble-making fractions from crude oil. And when we say "trouble-making" we mean the parts of raw oil which quickly break down into carbon and sludge.

Our "extra step," the Alchlor Process, gets extra amounts of these engine killers out of Gulfpride, so that Gulfpride gives high performance lubrication.

And high performance lubrication makes high performance engines possible.

LITTLE KNOWN FACTS DEPT.

Remember when we opened up the Little Known Facts About Well Known Planes Dept.?

We promised to commission you a Perch Pilot (bottom rung) if you sent us a "Fact" we could use. We also promised to promote you to Senior Perch Pilot after we'd run *five* of your "Facts."

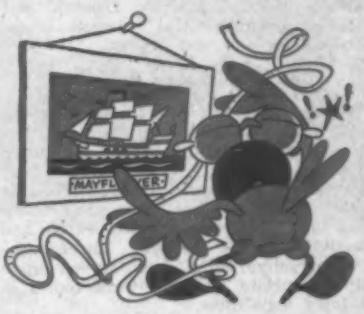
Well, Perch Pilot (br) Perry Young of Refugio, Texas, becomes the first candidate for promotion with the following item, his second to run:

"Since the first B-26 rolled off the line, its wing span has increased 6 feet and its tail has doubled in area!"

Here's another one from George R. Clay of 2919 Royer Place, Dallas, Texas (*who sent proof, too*):

"The P-51 is manufactured with fewer man hours than its assembly line mate, the AT-6!"

And peel our paint if we aren't going to commission another girl, this month! Her name's Helen Birnie of Western Air Lines, Inc., Los Angeles 14, Cal.



"The span of a Superfortress is greater than the overall length of the original 'Mayflower'!"

Make yourselves at home, Perch Pilots —your commissions are on the way. Receipt of your commission, incidentally, entitles you to purchase an extra War Bond this month!

Gulf Oil Corporation and Gulf Refining Company...makers of

GULF **GULF AVIATION PRODUCTS**

OIL IS AMMUNITION—USE IT WISELY

Pre-Legislative Air Planning In Iowa Pays Off; 3 Bills Pass

AVIATION interests in Iowa have set a pattern for other states to follow in their efforts to enact constructive aviation legislation.

Using the "grass roots" approach, the state's aviation leaders, some months in advance of the meeting of the state legislature, organized the Iowa Joint Aviation Legislation Committee, composed of members from all fields of aviation as well as representatives from many other civic and trade groups.

The strategy of this committee was to defeat harmful aviation legislation by advancing a constructive program which would have the support of all air-minded groups of the State.

Invited to the organization meeting were the presidents of the following state organizations and associations: Iowa Daily Press Association, Iowa Weekly Press Association, Iowa Flight Operators Association (Aircraft Service Operators), Iowa League of Municipalities, Iowa Organization of Chamber of Commerce Secretaries, Iowa Airport Managers Association, presidents of the Iowa Chapters of NAA and AOPA, and representatives of national organizations, including the airlines. Leo P. Brennan, national legislative chairman of NATA also assisted the committee.

Arthur I. Boreman, publisher of the *Dry Goods Journal*, Des Moines, was elected chairman and John Paul Jones, president of the Aircraft Owners and Pilots Association, was elected vice-chairman.

Boreman Makes Report

Boreman, reporting on the committee's work, said it was six months before the various groups within the committee could get together and submerge their differences and reach a meeting of the minds. However, after these preliminary discussions, self-interest disappeared and objectivity became the rule. Three highly constructive bills were agreed upon and appropriate sponsors were found in the Iowa legislature.

The success of the committee's work is evidenced by the passage of all three bills in the House and the Senate without a dissenting vote.

One bill, H. F. 358, created a five-man Aeronautics Commission, with a paid executive director. The act makes sure that Iowa aeronautics will be administered by executives who have a real interest and knowledge of aviation. Three members and the executive director must hold private pilot licenses. The director is the only member who receives a salary. The others receive only a per diem on expenses.

The powers of the commission are limited to the promotion and development of aviation rather than the issuance of regulations. Control of aviation either economically, or otherwise, is strictly limited and its major purpose is the all-around development of aviation with specific emphasis on airport development.

The second act, H. F. 365, is an Airport Zoning Act, based largely on the Uniform Zoning Act but tailored to meet the needs of Iowa.

The third bill, H. F. 366, is known as the Airports Act, which provides cities and towns the authority to issue bonds and to tax for airport purposes up to 1¼ mills per year in each city and town. Cities are given authority to issue revenue bonds—a provision which the committee feels will take a load off the shoulders of the taxpayers. The act provides that existing hazards at airports can be removed under proper condemnation proceedings providing proper compensation is paid.

President Boreman states that few times in Iowa's history have bills of such importance gone through the legislature without a dissenting vote. He attributes this success to the fact that the committee made a common sense approach to the entire problem and enlisted the cooperation and the help of all groups in getting bills drafted which would stand the test of friends and foes alike.

The committee has received favorable comments from all sections of the country and is hopeful that the Iowa way may be helpful to other states who are faced with similar legislative problems.

State Department Sets Up Procedures for Handling Visits of Foreign Experts

The State Department has announced procedures which are to be followed in rendering technical assistance to foreign aviation experts who come to this country to observe American civil aviation techniques, equipment, and installations.

Arrangements for these visits will be handled through the Aviation Division of the State Department, working in cooperation with the Civil Aeronautics Administration. Information regarding the names and positions of the proposed visitors, the proposed date of arrival and departure, the objective of the visit, including specific information as to the types of installations which are to be visited, with particular locations indicated by name wherever possible and expenses which the visitors are prepared to assume, will be obtained by the Aviation Division and transmitted to CAA.

If CAA is able and willing to make the technical arrangements for visits to specific points of interest, then the Division of Protocol, State Department, will attempt to obtain the clearances from the War and Navy Department and, once they are obtained, the responsibility for supervising the tours of the visitors will be turned back to CAA.

State Department Violated Constitution In Air Agreement, Says PAA Official

THERE are two big issues involved in our national air policy—namely, how will we compete in the international field; and should we give away our sovereignty over our air space?—Col. J. Carroll Cone, assistant vice-president of Pan American Airways, stated May 1 in an address at the fourth session of the Chicago Forum on Aviation.

In advocating the community company as the answer to the first, he said at one point, referring to figures compiled by Curtiss-Wright research which estimated that American Airlines alone should in 1950 carry some 2,070,000,000 passenger miles of traffic as against a total estimated international traffic on that date of only 1,548,000,000 passenger miles:

"These figures speak volumes. They indicate that what we all have to fear just now, particularly the domestic airlines, is not the myth of a monopoly in the foreign field but rather the existence of a potential monopoly in the domestic field. This creeping Colossus, if its present publicized appetities are satisfied, will become a virtual dictator in the domestic field as well as the international field."

Cone expressed opposition to the Five Freedoms advocated at the Chicago Conference and said that American labor leaders joined him in this opposition as well as in advocacy of a single community company.

Discussing "freedom of the air," Cone said: "If we become bound by the so-called Freedoms as suggested by Mr. Adolf Berle at the Chicago Aviation Conference, it will not matter how many separate American airlines are authorized to operate in foreign territories, because being left fully exposed to low cost foreign competition, they will soon wither up and of necessity be taken over by the Government.

"These Five Freedoms would permit any foreign aircraft to fly into and out of our country practically at will. The effect would be to put the United States flag overseas aviation industry outside the tariff wall. Our present laws require that foreign flag carriers apply for permits to operate into American territory. There must be public hearings; there must be action by the CAB and the President before such permits can be issued. In other words, the processes now required of a foreign flag carrier in general are the same as required for an American flag carrier before receiving a certificate to operate abroad from an American airport.

"It is readily seen that adoption of the Five Freedoms removes these controls of our Government on Foreign Flag Lines but retains them on our own lines . . .

"Our big stick in the postwar world will be a strong, coordinated, realistic civil aviation industry . . .

"But we can't have this strong civil aviation industry if we adopt Freedom of the Air. These Freedoms were embodied in two instruments recommended at the Chicago Aviation Conference. Recently the State Dept. announced that, by Executive Order, these instruments would be put into effect. This, I maintain, is in violation of our Constitution and sets a very dangerous precedent in our governmental machinery in these highly critical days."

"I saw a dump truck fly away..."

"First they backed an Army truck up the ramp into a Boeing C-97... Then after other loading was completed they hoisted the ramp, closed the doors, *and the fuselage became pressure-tight for high altitude, pressurized flight.*"

PRESSURIZED FLIGHT! Two words that define a new age of air travel! For a postwar adaptation of the C-97, to be known as the "Boeing Stratocruiser," will carry its passengers through the sub-stratosphere... faster, higher and in undreamed of comfort. The cabin pressure controls of the pressurized Boeing B-29 and C-97 planes were engineered, developed and are being produced by AiResearch Manufacturing Company, Los Angeles and Phoenix.

"Where Controlled Air Does the Job" Automatic Exit Flap Control Systems • Temperature Control Systems • Engine Air Intercooling Systems • Cabin Pressure Regulating Systems • Supercharger After-cooling Systems • Engine Oil Cooling Systems

AiResearch
DIVISION OF
THE GARRETT CORPORATION

RFC, CAA Working Together On Plane Disposal Program

One Ship of Each Model Goes to CAA for Tests, Maybe Type Certification

THE Reconstruction Finance Corporation is definitely cooperating with the Civil Aeronautics Administration on matters pertaining to the disposal of surplus aircraft, according to advices received from the CAA.

Some time ago the two agencies discussed the whole question of surplus aircraft at length, and it was agreed that at least one ship of each model would be turned over to the CAA for testing prior to being placed on the market, and that those types which were not eligible for type certification, or could not be easily made eligible, would not be offered for general sale except in cases where the buyer wished to use them for some special purpose and was willing to assume the risk of being able to get a restricted certificate for this use. In one or two cases such restricted certificates have been issued.

In general, each type of plane is tested by the CAA, and if it meets requirements, it is type certificated. If minor modifications are needed before it is certificatable, the CAA develops a set of specifications on what will be needed to make the plane comply, and these specifications are available to the buyer before he makes his purchase. In some cases, the original manufacturer has also made out a list of recommended changes incorporating those required by the CAA, and in such cases the cost of making these changes is also available in advance. The RFC is cooperating fully in not offering for general sale those types which can not be made to comply, or can be made to comply, only at prohibitive cost.

May Be in Poor Condition

While this agreement protects the buyer from unknowingly purchasing a type of airplane which cannot be certificated, however, it does not protect him in regard to the condition of the actual airplane he buys, which may be denied a certificate because of unairworthy condition, and might require major repairs and overhaul before one will be granted. Here it is completely a case of the buyer looking over the plane and assuming responsibility for its condition before he buys it.

In the case of three types recently offered by the RFC—a twin engine Cessna, a Vultee Valiant basic trainer, and a midwing Lockheed transport, the CAA tests show the following:

To make the Cessna eligible, the manufacturer has had to devise a stabilizing spring which is hooked into the control system to increase longitudinal stability. The navigation lights have to be changed. A cross feed gasoline line that goes through the cockpit and now creates a fire hazard has to be reworked. The RFC states that a kit of materials to effect these changes will be furnished by the manufacturer for $80. Assuming that the ship is otherwise in good condition, labor involved in making the changes should not exceed another $80 if it costs that much.

The Vultee Valiant has undergone preliminary CAA tests, and while the final report has not been prepared, these tests indicated that it would be eligible for certification with minor modifications, and the RFC was given the go ahead to prepare for its sale. This plane, however, will be restricted against intentional spinning, which will somewhat limit its usefulness for training and instruction.

The phrase similar to the Lodestar in the RFC statement has created some misunderstanding in regard to the Lockheed plane, with some people believing that it is the Lockheed 14 or Hudson which the CAA will not approve without what amounts to a complete new fuselage. The plane being offered, however, is the Lockheed 18, which is a modification of the Lodestar and is eligible for certification. Most of these planes, however, have a cargo floor and some structure which increases their empty weight, a fact which should be borne in mind by prospective purchasers since they will be licensed only for the same gross weight as the normal Lodestar.

The CAA protective policy is limited to domestic purchasers, and some planes which will not comply have been sold to foreign purchasers, but such planes have to be exported without an export certificate.

12½ Million for Airport

Los Angeles voters this month approved by a ratio of five to one a $12,500,000 Municipal Airport bond issue. The proposal needed only a two-one affirmative vote to carry. The fund will provide for expansion of the present Municipal Airport at Sepulveda and Imperial Boulevards.

One-Front Aircraft Production To Settle at 5,000 Per Month

By BARBARA MCNAMEE

PROSECUTION of a one-front war means production of American aircraft will drop to a rate of 5000 planes a month by the latter part of this year. The cutbacks ordered by the Army Air Forces during the past month affect all types of planes except the super-bombers and super-transports, although many cuts affect only the projected peak production to be reached by new planes in 1946. Navy contracts continue to call for full production.

The V-E Day cutbacks which have been going into effect in piecemeal fashion since early April eliminate the P-38 Lightning B-24 Liberator and all trainer planes. Major curtailments have been ordered in older types of transport planes, fighters and bombers.

P-38 production at Lockheed has been cut 40% below the first reduction and is scheduled to go out of production by November with facilities being turned over to the P-80 Shooting Star which will reach peak production in February, 1946, a 40% reduction from its originally scheduled peak. Lockheed's production of B-17s will be cutback 50% by June, but schedules for the C-69 military transport version of the Constellation will be increased to complete Army contracts by February instead of July, 1946. The company is hoping to obtain permission to advance schedules on production of the Constellation for the commercial airlines. PV Navy bomber production will be tapered gradually until orders are filled some time in 1946 but other Navy projects remain unchanged.

Consolidated Vultee will complete its production of B-24 Liberators and P-38s this summer but will continue in full production on the B-32 Dominator, the RY3 Navy Transport and other "experimental projects." The B-17 contract with Douglas Aircraft has been slashed 50%, and the scheduled peak for the A-26 "Invader" has been cut back while demands for the C-74 have been stepped up.

At North American Aviation's Dallas plant, the P-51 has been cutback 50% to continue at the reduced rate until June, 1946, but production of P-51s at Inglewood is unchanged. About 30% has been lopped off the scheduled peak of P-80 production at Kansas City while AT-6 output will taper ending in December. The C-82 "Packet" transport schedule remains unaltered.

Fairchild Aircraft Division at Hagerstown will also continue maximum output of the Packets.

At Republic Aviation the older models of the P-47 have been discontinued but orders are still continuing for the newer version.

The final assembly plant for Curtiss C-46 cargo planes will be closed by July. Although schedules are unchanged at St. Louis, the schedules for C-46s at Buffalo call for a 1/3 reduction by December and a smaller cut thereafter. Some cuts have also been ordered in production of the C-54.

Corresponding adjustments have been affected in aircraft parts and engine output. As a result of cutbacks in the P-38 the Curtiss-Wright propeller plant at Caldwell, N. J., will temporarily lay off 3400 employes but engine production will increase slightly at Wood Ridge. Schedules at other plants making engines for the B-29 and B-32 remain unchanged.

Cancellation of production of the B-24 will halt Buick production of Pratt & Whitney engines at the Flint and Melrose, Ill., plants. The contract of Continental Engine and Aviation Corp. for Rolls-Royce Merlin Engines will be cancelled effective at the end of May.

Aeroprops will save places for two

This Propeller's Battle-Tested Lightness Will Be a Payload Factor Soon

WHETHER it's a happy honeymooning couple, or less romantic payload, the pounds Aeroproducts has trimmed from propeller weight will make possible this additional plane capacity for peacetime flying.

Lightness is not the only factor that recommends this General Motors propeller. Its automatic, constant speed operation, simple unit construction, and ribbed-steel hollow blades are among the many features important to flying's future.

Like all General Motors products, the Aeroprop is the result of intensive research, engineering, and production developments. Built to more than meet war's demanding standards, battle-tested on every front, it will be ready to contribute equally to the progress of peacetime flight.

Today the Aeroprop serves flyers who have "dates" with Victory. It will serve tomorrow's honeymooning couples—and others who fly—with the same efficiency.

Aeroprop Advantages—*Lightness* for payload . . . *Strength* for safety . . . *Simplicity* for easy service . . . *Faster Automatic Pitch Change* for flight efficiency . . . *Full Feathering* for engine protection . . . *Engineered* for reliability.

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LIGHT • STRONG • RELIABLE

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For example, FEDERAL INSTRUMENT LANDING AND RADIO RANGE equipment is pioneering new concepts of faster, safer air travel.

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QUARTZ CRYSTALS, precision cut and mass produced at FEDERAL, are performing many secret military jobs.

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• • •

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Civilian Plane Output Expected To be Resumed in Near Future

Two-Engined Transports May be Available in '45; Four-Engined Come Later

WITH the relaxation of many curbs on civilian production and the Army Air Forces large scale cutbacks in war production, aircraft manufacturers may look forward to early resumption of at least partial civilian plane output. Best estimates at this time are that some two-engined transports will be available by late in the year with four-engined models coming off the line for commercial airline markets some time in 1946. Personal plane manufacturers hope to be making a few planes by summer.

The primary obstacle to production of light planes disappeared last week with the revocation of War Production Board Order L-48 which had forbidden production of civilian lightplanes since February, 1942. Manufacturers' requests that Order P-43 be amended to permit production of up to 25 model planes, instead of the authorized single prototype, have become unnecessary.

Other aircraft orders revoked by the War Production Board, upon its decision that production's V-E Day was April 26, included L-145, limiting the manufacture and delivery of aircraft control and pulley bearings, and L-235 and L-237, governing airport and aircraft lighting equipment.

However, the Controlled Materials Plan will remain in effect for several months with the result that civilian plane production will be sharply restricted. Manufacturers desirous of obaining materials must still submit CMP Form 4-B, stating material requirements, to WPB's Aircraft Division, accompanied by Form 3820, the manpower clearance form. Henry Nelson, director of the Aircraft Division, told *American Aviation* that he did not anticipate much difficulty in obtaining the necessary materials for plants with available capacity and manpower.

'Open-ending' of CMP Planned

When adjustments in the economy have been made so that the necessary production for a one-front war is guaranteed, WPB plans to "open-end" CMP and revoke the maintenance, repair and operating orders such as P-47 which provides the airlines with materials for those purposes. Open-ending CMP will mean that the elaborate priorities system will be replaced by two priority ratings: MM for military orders, and CC for important civilian goods. All materials not channeled into essential production by these ratings will be available on the open market.

Other actions which will aid manufacturers in reconverting their plants in preparation for civilian production call for assistance by WPB in obtaining bottleneck machine tools, capital equipment or minor construction. WPB is prepared to approve WPB-167 applications and assign AA-3 preference ratings for construction which is necessary to prepare for limited production of essential civilian items and which involves only a minor addition or alteration of an existing plant.

WPB Direction 2 to Priorities Regulation 24 provides for assignment of a AA-3 rating for procuring machine tools and other capital equipment necessary to begin essential civilian production. Manufacturers are urged to file their applications immediately with WPB field offices, marking them "Reconversion Preparation."

Announcement that Reconstruction Finance Corp. will make government-owned machine tools and production equipment available to industry as "fast as they are declared surplus," is expected to aid aircraft manufacturers in producing new commercial transport planes.

Nelson explained that in many cases a manufacturer might own his own plant, while the Army owned the tools and Defense Plant Corp. owned the machine tools. Some purchase or lease arrangement will have to be made before a manufacturer can produce commercial transport or lightplanes with this equipment. Nelson indicated that there are very few instances where a manufacturer will own all the facilities and equipment released from war production which he will need for his commercial aircraft production.

Facilities will soon be available for production of DC-3 and C-46 Commando planes to meet airline requirements for these types, and facilities are expected to be available for producing other cargo planes required by the airlines after the V-E Day cutbacks are made, he said. "In general it is assumed that materials will not be a bottleneck, although it is impossible to be sure until all cutbacks have been determined," Nelson said after meeting with the Aircraft Manufacturers Industry Advisory Committee.

A committee of the Aircraft Division, Army and Navy has been appointed to work out a program for production of the transport planes. Nelson said the committee would probably investigate each company separately approving its whole program at one time, or separately approving production of one transport model, without waiting for a goahead on all planes needed.

6,479 Surplus Planes, 700 Gliders Placed on Sale During Fortnight

SURPLUS AIRCRAFT placed on sale by Reconstruction Finance Corp. during the past fortnight include 2700 surplus twin-engine Cessna cabin monoplanes and 3700 Vultee Valiant single-engine basic trainers. The Cessnas are priced from $3900 to $8500 and the Vultees at $3600 to $4000.

In addition, 79 Lockheed C-59 transport planes are available at Bush Field, Augusta, Ga., with price tags ranging from $40,800 to $68,000. More than 700 surplus one to six-place gliders and sailplanes are also available at fixed prices ranging from $350 to $525. The craft include three-place Aeronca, Piper and Taylorcraft utility gliders, and one to three-place Frankfort, Laister-Kauffman, Schweizer, Pratt-Read and Briegleb sailplanes.

RFC states that the price range on the Cessnas are lower than the base price of $12,000 to allow for modifications and repairs. The $8500 is for planes equipped with constant-speed propellers and a wing eligible for approval to permit a 5400-pound gross weight. The lower priced planes have fixed-pitch wood propellers and a wing designed for a 5100-pound gross weight.

The Cessnas operate on 73 octane gasoline, cruise at about 140 mph and are suitable for business transportation, light cargo, charter, advanced pilot training or personal use, according to RFC. They are powered by two Jacobs Model L4MB engines of 225 hp each and are eligible for certification upon compliance with airworthiness requirements and modifications stipulated by CAA. A kit of materials necessary for modifying the planes is available from the manufacturers for $80.

RFC loaned a Cessna to a repair shop as an experiment to assist in pricing the planes. The plane was put in "de-luxe condition," including all necessary modifications plus new upholstery and a hand-rubbed exterior finish and resold at a profit.

The 3700 Vultee trainers, equipped with complete dual control and blind flying instruments, are two-place, tandem-seated with enclosed cockpit equipped with either a Pratt & Whitney Wasp, Jr., 450 hp or Wright 450 engine. RFC has been advised by CAA that preliminary reports indicate the Vultee planes will be eligible for a type certificate.

RFC warned that "the surplus gliders have been out in the weather for some time and, although some are new, they should be thoroughly inspected by prospective purchasers before making a choice." All but a few models have been approved by CAA as types suitable for civilian use, but many will require repairs before airworthiness certificates can be issued.

Some Gliders Well Equipped

Some of the gliders and sailplanes are equipped with radio, navigation lights and instruments. A number are on trailers for which an additional $75 is charged. The gliders formerly were sold by the bid method which was discontinued in favor of the price tag sales method on May 15.

Most of the gliders and sailplanes are located at RFC sales centers at: Bush Field, Augusta, Ga.; Souther Field, Americus, Ga.; Hicks Field, Fort Worth, Tex.; Cimarron Field, Oklahoma City, Oklahoma; Thunderbird Field II, Phoenix, Ariz.; and West Mesa Field, Albuquerque, N. M. However, RFC stated that all types are not available at each field and a few other gliders are located at other sales centers.

Information as to exact location of all surplus aircraft and gliders may be obtained from the Surplus Aircraft Division, Reconstruction Finance Corp. Washington, D. C.

Of the 3000 surplus primary trainers placed on sale by RFC on April 6, a total of 832 had been sold on April 24, the surplus disposal agency reports. Returns on these sales equalled $900,000. RFC states there have been a number of multiple sales to a single purchaser including one sale of 27 to a business man of Albuquerque.

Those attending the War Production Board's Aircraft Manufacturers Industry Advisory Committee meeting in Washington, April 24, included, from left (clockwise around table)—Clayton J. Bruckner, president of Waco Aircraft Co.; Alfred Marchev, president of Republic Aviation Corp.; Robert Gross, president of Lockheed Aircraft Corp.; J. W. Friedlander, president of Aeronca Aircraft Corp.; J. Carlton Ward, president of Fairchild Engine and Airplane Corp.; E. A. Bolster, WPB; Leo Panek, WPB; James A. Garfield, director of Surplus War Aircraft Division, DPC; Edward Heller, member of Surplus Property Board; Col. A. E. House, administrator of Surplus Property Board; Henry Nelson, director of WPB Aircraft Division; Morton Wilner, assistant director Aircraft Division; Grover Loening, WPB; Harry Woodhead, president of Consolidated Vultee Aircraft Corp.; Hans Klagsbrunn, deputy director of surplus property, RFC; E. E. Wilson, vice chairman, United Aircraft Corp.; Dwane Wallace, president of Cessna Aircraft Co.; T. Claude Ryan, president of Ryan Aeronautical Co.; William T. Piper, president of Piper Aircraft Corp.; Le Motte T. Cohu, president of Northrop Aircraft, Inc. Group in center of picture—Donald Douglas, president of Douglas Aircraft Co. (in light suit); Guy W. Vaughan, president of Curtiss-Wright Corp. (at left); Col. J. F. McManmon, of the Combined Chiefs of Staff (behind Douglas); Capt. L. D. Webb, Navy Bureau of Aeronautics (behind Vaughan); C. L. Egtvedt, president of Boeing Aircraft Co. (behind McManmon); L. A. Wells, president of Engineering and Research Corp. (rear).

ACCA Board Adopts Eight Recommendations Regarding Surplus Disposal Policies

Eight basic recommendations for the disposal of surplus aircraft, engines, accessories and facilities have been adopted by the board of directors of the Aeronautical Chamber of Commerce. They are:

(1) Postwar employment will be endangered through unwise surplus disposal; (2) Military security will be endangered if obsolete equipment is relied on for defense; (3) The future of civilian aviation will be harmed if bad bargains in cheap un-airworthy surpluses are released to private flyers; (4) A strong private industry is necessary to continue regular production of new and improved models and provide maximum expandibility in time of war; (5) To foster new production and employment, government-owned plants must be released to industry on a basis related to effective utility and commensurate with industry's ability to pay; (6) Competition by government surpluses must be eliminated if employment and economic wellbeing are to be promoted; (7) A relatively small dollar return may be expected from surplus sales after all costs of handling and selling are deducted; (8) It is desirable to preserve the basic value in excess surpluses by establishing strategic reserves of basic materials earmarked for war purposes only.

These recommendations will be presented to the various government agencies and to the public via a comprehensive publicity campaign.

AITA of Canada Appointment

The Air Industries and Transport Association of Canada has decided to become a contributing sponsor to the Canadian Radio Technical Planning Board, a central fact finding and recommending body, and has named S. S. Stevens, superintendent of communications and electronic development, Trans-Canada Air Lines, as its representative at CRTPB meetings. Stevens is also chairman of Panel E of the CRTPB.

WPB to Lift Many Controls Within Next Few Months

Nearly a third of the War Production Board's 100-odd controls will be lifted in the next three or four months, WPB Chairman J. A. Krug told the House Postwar Economic Policy Committee last fortnight. He indicated these controls could be relaxed in a few months.

Krug revealed that the Army Air Forces is now discussing its projected schedule of aircraft cutbacks after VE-Day with aircraft manufacturers even though some of the adjustments involved will not take place until the end of the year. He said these aircraft cutbacks would release enough aluminum to permit its use for some civilian production.

He indicated that considerable attention is being given to the problem of handling materials which become surplus due to contract termination. In the opinion of the War Production Board, said Krug, the most effective way to get the materials into immediate production is to allow them to flow without priority. The Surplus Property Board believes there should be a formal procedure for disposing of these materials giving priority preference to veterans, small business, government, etc. Krug believes a formal procedure will lead to great difficulty in getting the materials into use immediately.

The WPB Chairman stated that WPB had made every effort to equitably distribute contract cutbacks throughout the country. He explained that overall production cutbacks throughout the country by the end of the year have been estimated at about 33%, with overall cutbacks on the West Coast in the same period estimated at 25%.

CMA-LAMSA Agreement

Pan American Airways, and its Mexican affiliate, Compania Mexicana de Aviacion, have completed an interline exchange agreement with LAMSA, United's Mexican company, to facilitate passenger traffic between the two companies.

Five Physicians Named On NAA Panel to Draft Pilot Exam Questions

A panel of five physicians from Johns Hopkins University and the University of Maryland has been set up by National Aeronautics Association to prepare a "set of simple questions" to be used by doctors in examining applicants for student and private pilots license for submission to the Civil Aeronautics Administration. First meeting of the panel is expected next week.

The physicians, all specialists, are: Edmund L. Keeney, allergies; Walter Loch, ear and equilibrium; Moses Paulson, internal medicine; Herbert Schoenrich, urologist; and J. Guyton, eye, ear and throat. NAA states that the panel was being created before CAA announced that physical examination procedure would be simplified on June 1.

NAA has instructed the panel to "study the recent physical requirements with a view toward determining their validity under changed conditions . . . to evolve a suggested form consisting of a few simple questions which can be answered yes or no by any licensed physician in determining whether or not the applicant has any organic or functional disease or structural defect or limitation which would interfere with his safe piloting of an aircraft or other duties of his airman certificate."

CAA's Non-Scheduled Aviation Advisory Committee is also preparing a sample form for the physical examination which will be submitted to CAA.

CAP Supervision Re-assigned

Supervision of the military activities of the Civil Air Patrol, which was transferred from Army Air Forces headquarters in Washington to headquarters of the AAF Training Command on April 1, has been assigned to the three flying commands and two technical commands. National Commander Earle L. Johnson will supervise civilian activities from Fort Worth.

The High Way needs no Pavement

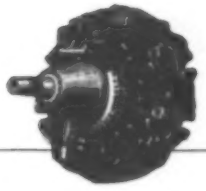
From its first chugging start, the automobile had inherent utility. But it took forty *billion* dollars, spent to build 3,038,000 miles of highways, roads and streets, to extract the vehicle's full use.

The airplane, with all of its inherent utility, needs no similar sum. Post-war construction plans, totaling between one and two billion, will go far towards making a world-wide air transport system available to any community in any location.

Lower air fares and cargo rates in the future will increase the value of such air transport to each city and nation. Reduced rates will result both from traffic gains and new equipment. Wright Aeronautical is helping to make such rates a reality by constant improvements in aircraft engines, by building engines that pay their way in use.

WRIGHT AERONAUTICAL CORPORATION
Paterson, New Jersey, U. S. A.

WRIGHT POWERS THE TONNAGE OF THE AIR



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In order to eliminate the radio interference caused by high-frequency impulses radiated from almost every type of electrical apparatus, Breeze pioneered the engineering and manufacture of shielding for aircraft, automotive, marine and industrial engines. Each application presented specialized problems which Breeze, with its wide background of experience in the field, has been well equipped to overcome. Today Breeze Shielding has stood the tests of 18 years of service, and is constantly being improved to meet new needs. During the war years this vital equipment, serving with our armed forces of land, sea and air, has played an important part in making possible dependable, interference-free communication between aircraft and ground, and from ship to shore.

In the electronic age of tomorrow, the thorough shielding of electrical equipment of all types will be of even greater importance. To manufacturers or users of such equipment, Breeze engineering and production facilities make it America's Headquarters for Radio Ignition Shielding. For a complete analysis and recommendation, call in a Breeze Radio Shielding engineer.

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U. S.-Colombia Reciprocal Landing Agreement Made in 1929 Revealed

A RECIPROCAL civil aviation landing agreement between the United States and Colombia made Feb. 23, 1929 was the first agreement of its kind made by the U. S. and still is the only such agreement between the U. S. and a Central or South American country.

Significance is being attached to it now because of the present moves toward international civil aviation agreements. Further, the Colombia agreement assumes importance because of the application of Lineas Aereas TACA de Colombia before the Civil Aeronautics Board to operate to the U. S.

The agreement was negotiated in 1929 when the predecessor company of Avianca (Aerovias Nacionales de Colombia), a Pan American Airways associate company, had plans for operating to the U. S. The agreement has never been used, however.

No other international aviation agreements were made by the U. S. until the late 30s when plans for operations to Canada materialized. Then came agreements permitting transatlantic operations.

The 1929 agreement with Colombia is somewhat sketchy and might be subject to various and conflicting interpretations, State Department officials believe.

The text of the agreement follows:

"Commercial aircraft of United States registry will have permission to fly along the Atlantic and Pacific Coasts of Colombia and over the territory immediately adjacent thereto; to land on land or water, fuel, make repairs, and ship and discharge passengers, mail and cargo, in the Atlantic and Pacific ports of Colombia where there are authorities charged with carrying out the pertinent regulations, subject to regulations and provisions equivalent to registry in the enclosures to this note.

Reciprocal Arrangements

"Reciprocally, commercial aircraft of Colombian registry will have permission to land on land or water in the Atlantic and Pacific ports of the United States including those of the Panama Canal Zone and to fly between the ports of the Canal Zone following the route designated by the Governor of the Panama Canal, fuel, make repairs and ship and discharge passengers, mail and cargo, subject to the regulations and provisions which are enclosed with the present note, as follows:

"For the continental United States, the Air Commerce Act of 1926 and the Regulations promulgated pursuant thereto; for the Panama Canal Zone, Executive Orders Nos. 4971 and 5047 of September 28, 1928, and February 18, 1929, respectively, and the Panama Canal issued pursuant thereto.

"All aircraft must carry out the respective Governmental regulations of both countries.

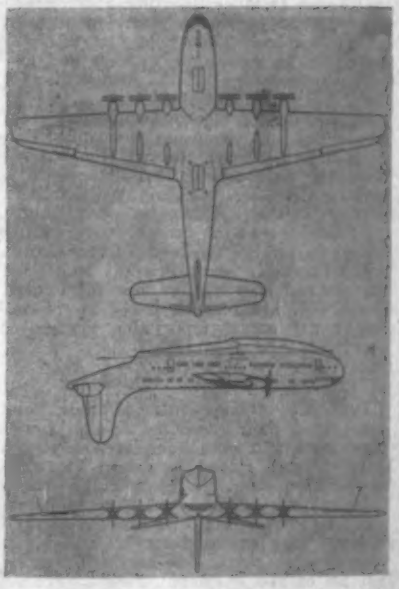
"If either of the two Governments decides to terminate the permission to which this agreement refers or to modify the regulations or provisions, it will give ninety days' previous notice thereof to the Government.

"It is understood that the two Governments agree and will endeavor to give the greatest possible facilities to aircraft in international commercial communication service in order that they may land on land, water, fuel, and carry out the other services above mentioned with all desirable speed and efficacy."

The TACA company has an application for three routes Bogata-Balboa, Bogata-New Orleans, and Bogata-Miami. Fifty-five percent of the stock is Colombian and 45 percent TACA Airways. The board of directors has four Colombian members and three TACA members. The president, manager and assistant manager are Colombians. TACA has a contract for technical management.

Air-Minded Bank Checks

The State Street Trust Company of Boston, already well known aeronautically for its aviation collection, has become even more air-minded. It is now issuing checks on which are reproduced in blue background various types of aircraft from balloon days to the glider, seaplane and DC-3. The checks were distributed during Aviation Week May 1-7 celebrating new airline services to Boston. The idea of dolling up the checks was conceived by Ralph M. Eastman, vice president of the organization.



Britain's Biggest—This 138-ton flying boat which the Blackburn Aircraft Co. has designed and will soon start building is the biggest and heaviest plane of its type ever undertaken in Great Britain. It has a span of 202 ft., overall length of 148 ft., and will carry up to 160 passengers or 90,960 lbs. of freight. Top speed will be more than 300 mph at sea level, and cruising speed will be 269 mph at 15,000 ft. The entire fuselage will be pressurized to an 8000 ft. level. The Blackburn flying boat is a private venture for which no official development order has yet been given.

RFC Considers Disposal Of Surplus Gliders By Price-Tag Advertising

Disposal of surplus gliders by the price-tag national advertising method used for primary trainers is under consideration by Reconstruction Finance Corp. According to the National Aeronautic Association, RFC may switch from selling the 1070 surplus military gliders on a bid basis, and sell direct to the public after a national advertising campaign.

"The advertisements, however, will specifically state that the gliders must meet certification standards before they can be used—thus avoiding one of the main points of controversy regarding the recent newspaper advertisements of the sale of surplus trainers," NAA declares. It is indicated that RFC will compute prices from the average prices received by the bid method and will dispose of the gliders at 20 sales centers throughout the country.

24 Attend Parks Seminar

Additional seminars for business men and women will be held at Park Air College, East St. Louis, May 21, June 4 and June 18. The first seminar from April 9 to 13 was well attended by 21 men and three women. A part of the five-day series of classes was devoted to instruction in flying.

Latin American-Caribbean Case Puts Sea-Air Issue Before CAB

Decision Must be Made For First Time; PAA's Dominance Threatened

By GERARD B. DOBBEN

THE Civil Aeronautics Board has before it another monumental air transport case wherein its decision will fix the pattern for international air commerce in the Latin American-Caribbean area for years to come. Also involved is the necessity for deciding for the first time the sea-air issue which has been bandied about since 1938 but which never has come before the Board on all fours until the Latin American-Caribbean case.

There are two important phases to the Latin American-Caribbean case. In the one phase, the Board will have to decide whether Pan American Airways shall have American Flag Lines competition in the Latin American area and if so, how much competition will be economically feasible. The other phase relates to whether this competition shall be furnished entirely by certificating existing airlines into the area, or whether a part of it shall be supplied by steamship companies which now operate through much of this territory.

The steamship companies went all-out in this case. Their best lawyers contended there was nothing in the Civil Aeronautics Act which would prevent the Board from certificating a steamship company to operate aircraft in a joint sea-air service. They held that this was definitely in the public interest and absolutely necessary to the preservation of the U. S. merchant marine.

Beset with the vigorous opposition from 13 airlines and steamship companies, Pan American Airways, through its counsel Henry J. Friendly, battled determinedly, almost alone, to maintain its dominant position in the field of international aviation. In view of the prospective great increase in foreign flag competition in this area in postwar years, Friendly contended that ill-advised action by the Board could well bring about chaos in the international air transportation system of the Latin American area.

Domestic Lines Fight Hard

Domestic airlines on the other hand prosecuted their cases for foreign routes vigorously and contended generally that only through strong American Flag line competition could air transportation reach its maximum development. They held that all of Pan American's predictions of lower rates, increased service and larger planes were predicated on its ability to get all of the business. They contended that only through competition with American carriers would the Board have a yardstick by which to measure the efficiency or lack of efficiency on the part of Pan American's operations.

The airlines seeking new or amended routes in the area, in addition to Pan American, were: American, American Export, Delta, National, Braniff, Chicago and Southern, Colonial, Eastern, Panagra and Western. Steamship company applicants were: Grace Line, Atlantic Gulf and West Indies Steamship Lines, Waterman Steamship Corp., and Moore-McCormack Lines. In addition there were several interveners, including many cities which would be affected by these proposed routes.

The case for the steamship companies as far as the provisions of the Civil Aeronautics Act is concerned was specifically presented by Sam G. Baggett, counsel for the National Federation of American Steamship Shipping.

Baggett told the Board that in this case, they were governed, as far as the steamships were concerned, by only Section 401 of the Act which relates to whether an applicant is fit, willing and able to perform the service and whether the service is required in the public interest.

He said Section 408 (b) did not apply as this provision deals only with the necessity of Board approval of an acquisition of control of an airline, but that acquisition of control was not an element in this case. The steamship companies were in this case as applicants in their rights, he stated, and they did not propose to operate through subsidiaries.

Ryan Takes Active Part

Board members kept referring to the intent of Congress and some of them, particularly Oswald Ryan, said he could not understand why Congress would have set up a separate agency such as the Civil Aeronautics Board, to administer this new form of transportation if it had not meant that surface companies were not intended to enter the air transport field. He thought that had Congress intended that other forms of transportation should be permitted to use aircraft, it would have placed the administrative responsibilities under the Interstate Commerce Commission.

Baggett read statements from the hearings and the Congressional debates in an attempt to prove that Congress had no intention of excluding steamship companies.

"I think this Board, after thorough consideration of the question involved in this case, will reach a decision that steamship carriers, applying in their own name for certificates of convenience and necessity, where no inter-corporate control is involved and where no application is in order under Section 408, should be treated as any other applicant. But if this Board is induced to hold that steamships are not, like other American enterprises, entitled to this equality of treatment, it will be the first time in the history of this country that any such rigid restriction has been placed on any type of carrier," Baggett declared.

Asserting that he was not afraid of any fact in the enormous record of the case, Friendly said what he did fear "is the failure to deal with the facts." He warned the Board against the great danger of loss of perspective in a case of this magnitude which might cause it to attach undue importance to the ambitions of this or that airline.

"There is a tendency also to believe that when so much is asked by so many, at least something must be given to a few," he added. "But the Board's concern is from the public standpoint; and that on a long-term basis. What is important from the public standpoint is that this system of air transportation in Latin America, built up over the years by the expenditures of millions of dollars, the public's dollars and Pan American's dollars, working together in a fine example of cooperation by Government and business, shall be developed as it ought to be developed."

Only in this way, Friendly stated, can the opportunity to provide air service from all parts of the United States to all parts of Latin America be preserved so that rates may be established which the average man can afford to pay, without the aid of subsidy, and that these opportunities shall not be frittered away by the authorization of uneconomic operations for the benefit of persons who previously were "quite content with other and greener pastures."

He said that in spite of what had happened within the last few months, the Board still has an opportunity to accomplish in this area the objectives which Congress directed and which the late President outlined—namely the establishment of a sound, well integrated transportation system to serve the needs of people of the United States and the Latin America area.

"We are not afraid of our ability to cope with these domestic airlines on any fair basis. If they want to compete with us in Latin America, we will compete with them in the United States and, from a purely selfish standpoint, we will do very well, indeed," Friendly stated. "But what we are afraid of is the complete breakdown of regulation in this area which seems now to be in process. We owe a debt of gratitude to Mr. Braniff for having furnished in advance such a clear demonstration that if you let one of these airlines proceed outside of the United States—even to Nuevo Laredo—you will be giving them a blank check for all of Latin America. If chaos is what you want, the way to get it has been plainly marked out for you."

Would Cripple Pan Am

Through use of charts, maps and tables, Friendly attempted to prove to the Board that under the most optimistic estimates contained in the record of the case, there were not more than one or two routes in the entire area that would support two American Flag carriers in the face of the foreign competition that was already in the area or has been announced in the expansion plans of foreign competitors. He said to certificate domestic carriers into Latin America out of Pan American's ports of entry, with their capacity to generate and control traffic from the interior of the United States, would be tantamount to rendering Pan American's certificates impotent. The only alternative the Board would have would be to certificate Pan American to interior points in the U. S., he stated.

CAB Calendar

May 29—Hearing, Southeastern States case (Docket 501 et al) (Sedgefield Inn, Greensboro, N. C.)

Aug. 19—Hearing, additional Cincinnati-New York service (Docket 231 et al) (Tentative)

Oct. 1—Hearing, Mississippi Valley case (Docket 548 et al) (Tentative)

KEEP FAITH
with your fighters
and yourself...
BUY WAR BONDS
FOR KEEPS!

EASTERN Air Lines

Proposals for Establishment of Feeders 'Premature', Says W. A. Patterson

INCREASED schedule frequency will be one of the "salient and most immediate improvements in airline operation" within the next few years, but proposals for the establishment of local and feeder air service to smaller cities are "premature", in the opinion of W. A. Patterson, president of United Air Lines.

Speaking before the Chicago Forum on Aviation, Patterson called for the regulation of all airline carriers, including the so-called non-scheduled operator and contract carrier—primarily through a system of classifications. He expressed a generally optimistic view for the possibilities of air cargo development.

With respect to the future development of trunk line routes and services, Patterson said there were in the U. S. today "only 52 unserved cities of over 25,000 population located more than 25 miles from an airline stop," and predicted that the "first development which can reasonably be expected in the changing trunk-line pattern service is the addition of points to existing routes and thus an increase in the total number of places accessible by air."

He said the increase in non-stop operations may lead, in effect, "to the superimposition upon the present air net work of a second route pattern with considerable variation from that now established . . . With the development of larger aircraft, non-stop operation over the longer, even the transcontinental routes, becomes feasible; and it has been suggested that a system of airways following the great circle routes should be provided for them."

Foresees Direct Competition

Patterson said that more direct competition between trunk line carriers will be the rule in the future, although this trend may be tempered to some degree "by proposals now being made for through service by means of an interchange of equipment by airlines."

"Still another means which we may expect to see employed to further the integration of our air route pattern, and one for which there is a greater background of precedent, is that of merger of existing domestic systems," he added.

Patterson said that airline service up to the present has been a one-class, one-rate service, but that the expected increase in schedule frequency and in variety of equipment available "may lead to more differentiation than in the past . . . Another possible development, especially for shorter trips, is that of dispensing with reservations."

With respect to local and feeder line routes and services, Patterson said that favorable competitive conditions "are unlikely to prevail when the airplane attempts to tap the short-haul market . . . For trip lengths under 100 miles, allowing for intermediate stops, no material speed advantage can be claimed over the private auto or the intercity bus or train."

"Full development of the helicopter . . . may provide the key to effective competition for short-haul city-to-city traffic; and cost may one day be reduced to the point where the 2c per mile bus and coach market may be cultivated by the airlines. We do not believe that these developments are in view over the next five years . . .", he said.

With respect to non-scheduled services, Patterson asserted that "as seen in the light of present knowledge a large part of the proposed services appear either to be outside the economic scope of the air transport picture, or could be more effectively performed by the regular route scheduled operator."

"The national air transportation policy requires regulation such as will promote sound economic practices and prohibit destructive competition . . . If the declared policy is to be executed, it is necessary that appropriate regulation be extended to presently unregulated carriers."

Patterson said to provide for the growth and progress of air transportation, "it is suggested that until the proper place of the contract carrier has been determined by experience, regulation be restricted to certain minimum requirements . . . When not inconsistent with the public interest, common carriers should be allowed to perform contract carrier operations."

He predicted that the ton-mile volume of first class mail that can ultimately be expected to be transported by air "appears to be 6½ times the volume of what was commonly known as 'air mail' in the normal prewar years. Inasmuch as passenger traffic volume can be expected to increase a like or greater amount, a policy of 'all first class mail by air' should not materially disturb the relationship that has existed in the past between mail and passenger volumes."

With respect to air cargo, he said "our studies to date indicate that the most likely field from which the transport of general merchandise can be diverted to the air is that now moving by first class railway express."

Proposes Capital Airpark

Plans for an airpark to be built in conjunction with the proposed National Memorial Stadium in Washington have been presented to Senator Theodore Bilbo, chairman, and Rep. Jennings Randolph, vice-chairman of the Stadium Commission, by Robert H. Kinkead, president of the Aero Club of Washington.

CAB Grants Essair Texas Certificate

The Civil Aeronautics Board, in a supplemental opinion released April 27, affirmed its decision of Nov. 4, 1943, granting a temporary certificate to Essair, Inc., for service between Houston and Amarillo, Tex., via San Angelo, Abilene and Lubbock. W. F. Long is chairman of Essair's board.

Long

The decision pointed out that because of delays due to court proceedings and "through no fault of its own," Essair will not be able to operate the route for the full three years contemplated by the certificate, which expires Dec. 31, 1946, but that "Essair will have ample opportunity to apply to the Board for an extension of time so that their operations may cover a full three-year period."

The CAB announcement culminated a legal proceeding which was initiated by Braniff Airways Mar. 25, 1944, when Braniff filed a petition for review of the Board's original decision to the U. S. Circuit Court of Appeals. The court generally upheld the Board, but remanded the case for further hearing with respect to Essair's organization. Following the hearing, the case was returned to the Board for decision.

Two of Essair's Lockheed Electras

Amex Asks Fixing of Mail Pay Subject to Change

American Export Airlines has petitioned the Civil Aeronautics Board to fix the carrier's annual mail pay at $1,587,900 for 1945, subject to further adjustment.

The petition was filed, Amex said, because of the additional time which will be required for the carrier to prepare additional evidence to support a figure of $212,000 for amortization of extension and development expenses. The additional data were requested by public counsel and the examiners during the recent hearing on Amex's mail pay.

Favors Postwar Control Towers

Continued operation of control towers at those airports where such service was installed as a military need is advocated by the Civil Aviation Joint Legislative Committee.

Global shrinking

COME to think of it, part of our business, like yours, is making the world smaller. By telescoping time and space with *speed*. We contribute to the process in two ways. First, hydraulically. With fast-acting power actuators and controls. Precision designed for war-planes, cargo carriers and commercial aircraft that make ponds out of oceans, islands out of continents. Second, electronically. With radio communication equipment that shrinks thousands of miles into an instant. Such as the **Aireon** Type 508 Transmitter for ground-to-plane and point-to-point conversation. It's used by the Army Air Transport Command and commercial airlines to monitor global air traffic, keep planes hopping. Hydraulic or electronic, it's our stuff; designed and built from the ground up by **Aireon** engineers with real technical savvy and produced in plants equipped to handle precision work on a quantity basis. The same combination is available to handle your problems whenever you say.

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Dressed to fight ice

2 EMPENNAGE DE-ICERS work positively and efficiently giving horizontal stabilizers and fin complete ice protection. Small diameter light aluminum tubing carries air pressure back to De-icer tube openings.

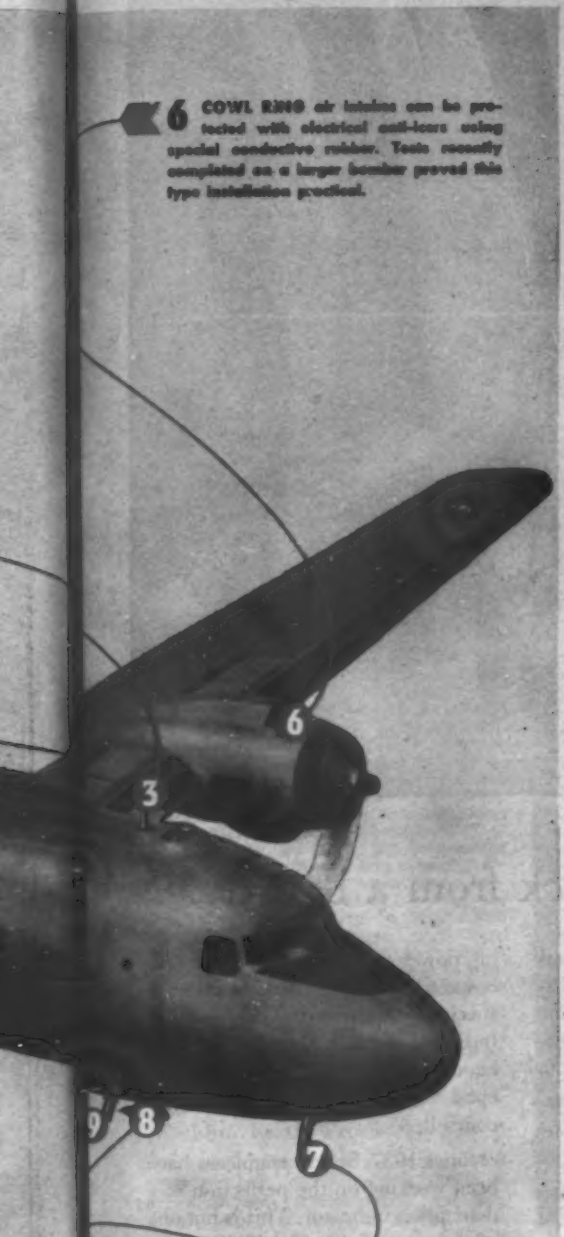
3 ANTENNA MASTS can be protected against ice build-up by easily installed tube-type De-icers. Electrical anti-icers employing conductive rubber are in the development stage for this application.

1 WING DE-ICERS have been steadily improved since their introduction in 1930. The latest type is the best ice-protection device ever developed for aircraft. The entire critical leading edge area is protected—chordwise and spanwise—with operation just as efficient at the wing tips as near the fuselage. De-icers present no structural hazards and they represent only a fractional percentage of a commercial plane's gross weight.

4 PROPELLERS can be protected two ways. B. F. Goodrich makes both feed shoes (which utilize anti-freeze fluid) and conductive rubber shoes (electrically heated).

5 SPINNER DOMES need anti-icers, too. Electrically heated conductive rubber caps may be the answer, and B. F. Goodrich development work is under way.

e at all critical points...



6 COWL RING air intakes can be protected with electrical anti-icers using special conductive rubber. Tests recently completed on a larger bomber proved this type installation practical.

7 PITOT MASTS can be fitted with easily installed rubber De-Icers operating on the regular De-Icer system. Tests are being made on an electrical anti-icer for this application.

8 DIRECTION FINDER is another accessory that suggests the electrical anti-icer treatment.

9 ALL PROTRUDING accessories can be equipped for ice-protection. De-Icers are already available for tee-wings, pontoons, wing slots and slats. And electrical anti-icers may prove even a better answer to accessory icing.

Only B. F. Goodrich offers this *complete* ice protection

EVERY unprotected leading edge surface that bites into icing conditions can and does pick up its load of ice. Wings, empennage, propellers, spinner domes, antenna masts and housings, direction finders . . . all need ice protection for maximum safety and efficiency. And B. F. Goodrich makes the equipment to do the job.

For wing and tail leading edges, the B. F. Goodrich rubber De-Icer is the best protection device ever developed. De-Icers guard *all* critical surfaces. They operate just as positively *at the wing tips* (where stall is most critical) as near the fuselage. These tube-type De-Icers also effectively protect pitot and antenna masts and other protruding accessories.

Tube inflation selectivity, variable inflation sequences, and instantaneous inflation and deflation, secured by recently developed operating equipment, improve the effectiveness and efficiency of the De-Icer system.

B. F. Goodrich offers *two* excellent ways to protect propellers. Best known are the rubber feed shoes which guide anti-freeze fluid out along edges to keep ice from forming. A more recent development is the heated propeller shoe.

Like the feed shoe, it is attached to the blade leading edge, but it operates on electricity from a hub generator or other source of electrical energy. This current flows out through electrodes on both sides of the shoe and across the icing surfaces through specially compounded conductive rubber. Carefully designed resistances concentrate heat directly at the leading edges where most ice forms.

More electrical anti-icer developments are on the way. Successful tests have already been completed on the cowl ring air intakes of a large bomber. Other suggested applications are masts, fuselage nose, spinners and struts. You'll probably be hearing more about these in the near future.

Perhaps you have a problem that over twenty years' ice-fighting experience will solve. If so, get in touch with "headquarters"... The B. F. Goodrich Company, Aeronautical Division, Dept. C-5, Akron, Ohio.

All made by B. F. Goodrich . . . Fuel Cells (self-sealing and non-sealing bladder type) . . . Fuel and Hydraulic Hose . . . Extruded Parts . . . Grommets . . . Airplane Tires . . . Expander Tubes for brakes . . . Rivnuts.

Skyway or Highway

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FIRST IN RUBBER

How electronics helps tell a knock from a boost...

THE MIT-Sperry Detonation Indicator is an engine instrument that discriminates between normal and abnormal combustion.

Through an electronic pickup, it *instantly detects detonation*—popularly called knocking or pinging—in most types of internal combustion engines. And it gives *immediate evaluation of detonation.*

As a result, warning is given at the time trouble *starts* . . . engine life is lengthened . . . mixture may be adjusted so that considerable fuel is saved . . . and the period between engine overhauls is extended.

No piercing of engine cylinders is required. Yet even the slightest detonation is signalled visually, and the faulty cylinder or cylinders spotted.

Use of the MIT-Sperry Detonation Indicator on airplanes results in remarkable fuel savings, longer engine life, greater safety.

The same is true of surface transportation which employs internal combustion engines.

Engine manufacturers find this instrument an invaluable aid in designing and testing. It also permits development of fuels exactly fitted to engine characteristics, thus increasing power output and lowering fuel costs. Also with the Knockometer, a special application of the Detonation Indicator, fuels with superior anti-knock characteristics can be developed and their quality production controlled.

Since 1937, Sperry engineers have been working on the perfection of a detonation indicator. This is but one of the many fields in which Sperry has pioneered in the field of electronic development.

Additional information on the MIT-Sperry Detonation Indicator is available on request.

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TWA Favored for Route From Chicago to Asia

Three members of the Public Counsel's staff of the Civil Aeronautics Board have recommended to the Board that TWA be given an air transport route from Chicago to Asia, via the Kurile Islands, if TWA is not certificated for a route across the North Atlantic. If TWA receives the North Atlantic route for which it has applied, then the Public Counsel lawyers recommend that the route be given to Northwest Airlines.

Their recommendations include extensions to existing certificates of Pan American Airways in connection with its Pacific operations and the proposal that Alaska Airlines be given a certificate for a route between Anchorage and Seattle.

The recommendations follow:

"1. That an air route be authorized over the North Pacific to Asia through the Chicago gateway from such terminal or terminals in the United States as the Board shall see fit, that said route shall terminate at Manila, P. I., with intermediate stops at St. Paul-Minneapolis, Minnesota; Anchorage, Alaska; Paramushiro, Kurile Islands; Tokyo, Japan; Shanghai, China and Hong Kong (or Canton), China;

"2. That TWA be selected as the carrier to fly said route unless TWA is awarded a route over the North Atlantic in which event we recommend the choice of Northwest over PCA.

"3. That Pan American's certificate of convenience and necessity for its existing Central Pacific route be amended so as to authorize extensions of its said route as follows: (1) from Honolulu to Wake Island, bypassing Midway Island; (2) from Midway Island to Tokyo, Japan; (3) from Tokyo, Japan to Shanghai, China; and (4) from Shanghai, China to Hong Kong (or Canton), China;

"4. That Pan American's certificate of convenience and necessity for its existing South Pacific route be amended so as to authorize an extension of said route from Noumea, New Caledonia, to Sydney, Australia;

"5. That Alaska Air Lines, Inc. be awarded a certificate of convenience and necessity for a route from Seattle, Washington, to Anchorage, Alaska; subject, however, to the restriction that it shall serve no local traffic between Anchorage and Juneau, or between Ketchikan and Juneau, Alaska, and that it may stop at any of said points only to pick up or discharge passengers originating at or bound for Seattle."

The report was signed by Merle P. Lyon, V. Rock Grundman and Russell S. Bernhard, public counsel.

'Fashion Fresh' Frocks by Air

American Airlines recently inaugurated a new method of delivering "fashion fresh" California frocks when an Air-freighter left Los Angeles loaded with dresses consigned to 80 cities throughout the United States. The dresses were transported in individual transparent bags with specially designed hangers, eliminating the weight of cartons and the time of packing and unpacking.

Locomotives Moved by Air

Eighteen five-ton, gas, meter gauge locomotives have been flown to Burma in the first air-locomotive flight in history, the War department announces. The locomotives, built in 92 days to meet the urgency of the British Army's supply problem, were flown by the Air Transport Command.

C-54 'Demonstration' Protested by British

A special correspondent for the London *Daily Mail* cabled from the South Africa Air Transport Conference, held late in March at Cape Town, that the United States had "diverted" a four-engine Douglas C-54 transport from military service to show it off to those attending the Conference. Lord Swinton, British Minister for Civil Aviation, flew in a four-engine Avro York transport to the Conference.

"It seems that the American Douglas Skymaster plane now in Cape Town was specially diverted from the America-India run to 'show itself' before the Conference," the *Daily Mail* dispatch said.

"This gesture has not been notably successful owing to an inexplicable 'short-sightedness' of local news editors."

Aerovias Braniff Given Cuban Permission To Operate Into Havana

The Cuban Government has granted Aerovias Braniff, S. A., permission to operate into Havana, according to T. E. Braniff, president of the Mexican airline. Aerovias Braniff has permits from the Mexican Government to operate from Mexico City to Miami by way of Pueblo, Vera Cruz, and Merida, Mexico, and Havana.

Braniff said the next service to be inaugurated sometime in June will be from Mexico City to Merida as the first segment of the Mexico City-Merida-Havana service. Aerovias Braniff has pending before the Civil Aeronautics Board an application for a foreign air carrier permit to serve Miami, Mexican permission for which it already holds. Braniff said negotiations would be entered into immediately for ground facilities in Havana. He pointed out that recently the Cuban Government passed a decree making all airports in that country public airports.

New Flight Service Dept. Created by Continental

Creation of a new department, to be known as the Flight Service Department, is announced by Continental Air Lines.

The new department will be in addition to the four major departments which have made up Continental in the past: Operations, Maintenance, Traffic, and Treasury.

Flight Service will be responsible for those functions (formerly carried out by the Traffic and Operations Departments) which have to do with the safe, courteous and efficient handling of passengers and proper handling and servicing of mail and air express. The department will be composed of five major sections: 1. Central reservations control, 2. Passenger service, 3. Station service, 4. Hostess service, 5. Food service.

Under the new organization structure the Traffic-Sales Department will concentrate its entire efforts to planning, developing, and directing the company's sales, merchandising and promotion efforts. The Operations Department will be charged with all activities which have to do with safe and efficient operation of flights—including flight control, meteorology, and the supervision and training of pilots.

Aerovias Braniff Inaugural Scenes—Above photo shows the inaugural party when Aerovias Braniff, S.A. began operations from Mexico City April 3. Left to right—President Manuel Avila Camaco of Mexico; Robert E. Smith, Houston, Tex., chairman of the Texas Good Neighbor Commission; Governor Gonzalez of the State of Tamaulipas; Tom E. Braniff, president of the airline; Mrs. Braniff; Rafael Arce, highway commissioner of the State of Tamaulipas; and Walter M. Hanshel, Braniff's director of publicity. At right—Senora Emma Gonzalez, wife of the governor, christens the first Aerovias Braniff plane 'City of Victoria' as her husband looks on.

America Has Heart Trouble

SOUNDS ominous doesn't it? But wait . . . it *can* be cured. Look at it this way. There's a "Heart Market" in Mid-America producing grain, iron, meat, hides, fur, lumber, sugar, and salt . . . basic things. But it's underdeveloped because many of its people can't get from where they are to where they want to go, easily, quickly, conveniently, inexpensively . . . and these people *must* go where they *need* to go to keep the "Heart of America" strong and able to compete for trade. That's where Mid-Continent comes in. For although it serves this inland empire well it needs to expand to directly connect with *primary* markets. Then and only then will it *fully* serve. Yes, America's "Heart Line" needs more arteries so its "Heart Market" can grow and prosper. World Markets? Sure, we *must* have them. But let's not forget we need to be strong inside to match market strength outside.

★

Frequent Daily Service to

KANSAS CITY — OMAHA
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MINNEAPOLIS — DES MOINES
SIOUX CITY — ST. LOUIS
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MID-CONTINENT AIRLINES

SERVING MID-AMERICA

CAA Plans to Put Automatic Communication System Under Service Test

THE Civil Aeronautics Administration hopes to place an automatic communication system for traffic control under service test along the New York-Washington airway, Thomas B. Bourne, Director of Federal Airways, told members of the Institute of Radio Engineers at Williamsport, Pa., last fortnight. After the ground equipment associated with the plan has been installed and perfected, he said, the next two phases proposed for development will consist of making automatic the reporting of aircraft position as the pilot flies along established airways, and making automatic the display of traffic control instructions, perhaps visually, in the plane's cockpit.

Speaking on the subject of delegating more responsibility to the pilot for the safe navigation of his plane, Bourne said two pieces of equipment—a distance indicating device that will permit the pilot to measure, at any time, his distance from a range station, the end of a runway, or perhaps another plane, and a collision warning device that will operate under instrument conditions—are needed. He added that the first already has been developed for war purposes, and that it probably will not be too difficult to work out the peacetime application.

The collision warning device, he said, may or may not be based on wartime electronic techniques such as radar. He pointed out that the CAA in 1940 started work on what was termed a "vertical separation indicator," but which, if successfully developed, would be a very satisfactory collision warning indicator. Work on this development was delayed due to the war, but the CAA hopes to revive the project and test it thoroughly.

Bourne stressed that we must keep the private flier in the forefront of our minds and in the first paragraph of our plans instead of in the postscript as in the past. He believes the private flier would be the radio engineers' biggest customer.

The whole plan of the CAA for navigation, communications and traffic control, he said, contemplates that it will be possible for the average private pilot to secure all the essential airways services through the use of but one receiver which must be capable of covering the 108-132 mc frequency band without interruption, either by push-button or by tuneable control.

WAL Elects New Director; Coulter Reelected President

Western Air Lines announces that William A. Coulter, head of the company since 1941, has been re-elected president and chairman of the board.

The company reports that four incumbents on the Board of Directors have been re-elected and one new director, Glenn C. Wharton, president of the Kirkendall Boot Co., Omaha, has been elected. Wharton is also a director of the Nebraska Power Co. and of the Omaha Lumber Co. both with headquarters in Omaha.

Present members of the board re-elected are: L. H. Dwerlkotte, executive vice-president of the airline; Stanley W. Guthrie, senior member of the legal firm of Guthrie & Darling of Los Angeles; and George Albert Smith, president of the Latter-Day Saints Council of Twelve Apostles, Salt Lake City, Utah.

New Type Engines, Props Approved by CAA

New type certificates issued by the Civil Aeronautics Administration for aircraft, aircraft engines, propellers, and appliances include:

Engines

Aircooled Motors, Franklin models 6AL-s15-C2, D3, F3 and F6; 6 cyl. horizontal opposed air cooled. Ratings: (Model C2) 125 hp at 2600 rpm, (Model D3) 140 hp at 2600 rpm. (Models F3 and F6) 155 hp at 3000 rpm. Dry weight 270 lbs. Minimum octane fuel: (Model C2) 73, (Remaining models) 80. Provisions for use of fuel pump, electric starter and generator, and an engine speed governor on model F6. (Type Certificate No. 234, 3-19-45).

Propellers

Stone, models S225 and S225A; wood; 90 in. diameter; 84 in. to 60 in. pitch; 225 hp, 2000 rpm. (Type Certificate No. 812, 3-2-45).

Hartzell, models 1010, 1011, 1012 and 43K-10107; wood; 72 in. diameter; Pitch: (models 1010, 1011, and 1012) 47 in. to 37 in., (model 43K10107) 42 in.; 65 hp, 2350 rpm. (Type Certificate No. 813, 3-6-45).

Hartzell, models 1113 and 43K26463; wood; 86 in. diameter; Pitch: (model 1113) 61 in. to 51 in., (model 43K26463) 57 in.; 200 hp, 2450 rpm. (Type Certificate No. 814, 3-6-45).

New Models

New models added to old type approvals:

Engines

Pratt & Whitney, model Twin Wasp 2SC9-G; 14 cyl. radial aircooled. Rating: Take-off. 1350 hp at 2800 rpm; Maximum continuous operation, (low blower ratio) from sea level to 7400 ft. altitude, 1100 hp at 2600 rpm; Maximum continuous operation, (high blower ratio) from 10,000 ft. to 14,250 ft. altitude, 1000 hp at 2600 rpm. Grade 100/130 fuel. Dry Weight 1573 lbs. (Type Certificate No. 186, 3-26-45).

Aircraft

Fairchild, model M-28C (Army Pt-23 Series); 2 place open or closed land monoplane. Engine, Continental W-670-6A or -6N. (Type Certificate No. 724, 3-26-45).

Propellers

Lewis, models L11C, L11C-1 and L11C-2; wood; 70 in., 69 in., and 68 in. diameter, respectively; 47 in. to 33 in. pitch; 75 hp, 2600 rpm. (Type Certificate No. 797, 3-10-45).

Sensenich, model 86RB; wood; 86 in. diameter, 62 in. to 50 in. pitch; 300 hp, 2450 rpm. (Type Certificate No. 586, 3-20-45).

Sensenich, model 84EL; wood; 84 in. diameter; 53 in. to 47 in. pitch; 100 hp, 2100 rpm. (Type Certificate No. 485, 3-31-45).

Appliances

Hayes, smooth contour wheels, model 5050A; 30 in. Approved static load per wheel 8200 lbs. (Type Certificate No. 101, 3-16-45).

CAL-AERO

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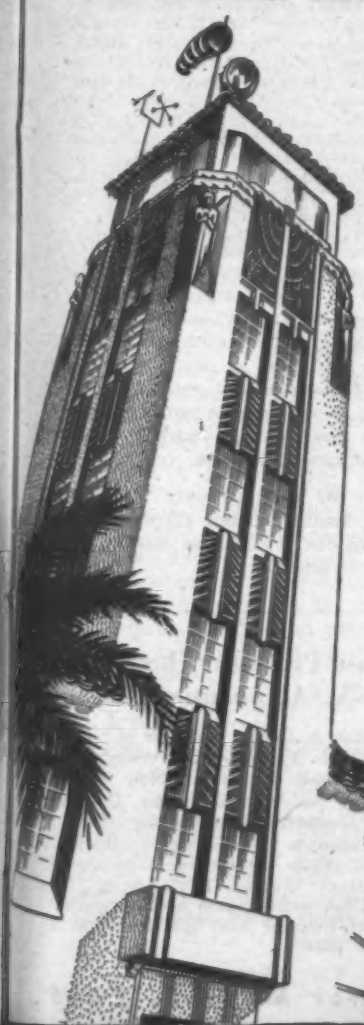
LEADS THE WAY



CAL-AERO leadership in its particular field of Aviation training is built . . . ON MERIT ALONE

Year after year since 1929—the name "Cal-Aero" has become symbolical of the highest standards in Aviation training. These schools have been honored and cited for distinguished service. With an unparalleled record of efficiency and safety, nearly 25,000 pilots and 7,500 technicians have been trained for the Army Air Forces, while at the same time graduating thousands of civilians for the production front. To keep pace, "Cal-Aero" has purchased out-right Grand Central Air Terminal, Glendale, California. This famous pioneer and modern airport was originally acquired in 1929 by the Curtiss-Wright Corporation at a cost of almost $3,000,000, and so, with such assured confidence in the future of Aviation, it is a forecast of greater Cal-Aero activity to come.

GRAND CENTRAL AIRPORT ... IS THE NEAREST AIRPORT TO THE HEART OF LOS ANGELES

CAL-AERO TECHNICAL INSTITUTE

MAJOR C. C. MOSELEY — PRES. SINCE 1929

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CURTISS-WRIGHT CAL-AERO TECHNICAL INSTITUTE

THIS TOWER OVERLOOKS AVIATION'S MOST DISTINGUISHED SCHOOL OF AERONAUTIC

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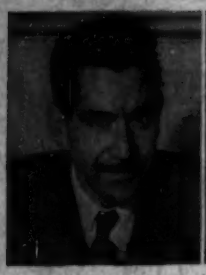

Llorente

Fobes

Correa

Dalton

Judd

England

Misket

Fauteux

Executive

T. E. Braniff has been elected president of Aerovias Braniff; **Antonia Correa** and **Douglas Stockdale** have been named vice presidents; **Alberto Sanches Llorente**, treasurer; and **Jess Dalton**, secretary.

George W. Mason, president of Nash-Kelvinator Corp., and **David L. Frawley**, vice president of Barnsdall Oil Co., have been elected members of the board of directors of Pennsylvania-Central Airlines.

Lee H. Dwerikotte, 42, executive vice president of Western Air Lines, and Catherine Reidy, 37, of San Francisco, were married April 12 in Miami Beach, Fla.

J. D. Crane has been appointed vice president in charge of maintenance and engineering for National Airlines.

Thomas Prevost, National Airline's Eastern regional traffic manager, has been appointed assistant vice president, and **R. P. Foreman**, the airline's secretary and executive assistant, has been named a director.

W. I. Van Dusen, 46, director of public relations for Pan American Airways, and **Katherine Lee Lohr**, 21, of Cherryville, N. C., were married April 14 in Greenville, S. C.

Operations

Capt. Frank Judd, veteran Northwest Airlines pilot, has been appointed to the newly-created position of general manager of the company's Western region.

L. T. Long, assistant chief of engineering for United Air Lines at Chicago, has been placed in charge of the airline's new engineering organization at Cheyenne, Wyo., with **R. L. McBrien** and **D. W. Tyler** as assistants.

Capt. Albert J. Misket has completed 10 years as a Pennsylvania-Central Airlines pilot.

Traffic

James J. Fauteux, DTM for Northwest Airlines at Chicago, has been named passenger traffic manager for the company's entire system.

Vincent McComb has been appointed National Airlines' city traffic manager for New York City.

Pan American Airways announces the following station manager appointments in order to handle increased flights on its Seattle-Fairbanks route: **Kenneth Alexander**, Juneau; **Marion Deutsch**, assisted by **William McRoberts**, Fairbanks; **Joseph Morrison**, Whitehorse; **Robert Thorp**, Port Hardy; **John E. Frost**, Annette; **Clyde Smith**, Nome; and **Clark Basset**, Seattle.

W. R. England has been named DTM at Detroit and **W. H. Fobes, Jr.**, has been named acting DTM at Chicago for Northwest Airlines. The former was DTM at Spokane. He will be assisted by **Oscar Mardell**, traffic representative for NWA at Minneapolis, and **Morris Bakken**, of the company's central statistical office, St. Paul. Northwest also has appointed four men to key positions in the station's organization at New York; **Robert Gordin**, chief agent; **Loren Brown**, **Robert Miller**, and **William Carey**, senior transportation agents. **Rex Poppe** and **Thomas Haugen**, transportation agents at Chicago, have been transferred to Minneapolis in similar positions, and **Paul Patrick**, senior radio operator at Milwaukee, has been appointed acting station manager at Buffalo, N. Y.

Miscellaneous

Kurt Springer, United Air Lines, who has been in Mexico organizing station management for United's subsidiary company, LAMSA, has returned to the U. S. to resume his duties as supt. of stations. **Charles P. Graddick**, superintendent of air cargo service for United, has been making a study of cargo and mail potentials in Mexico for LAMSA.

Thomas A. Bell, formerly associated with the Madison Square Garden Corp., has joined the Washington staff of the TWA News Bureau.

Monro Urges Modern Traffic Control Devices

Declaring that the airline industry has many knotty problems confronting it, C. Bedell Monro, president of Pennsylvania-Central Airlines, issued a plea for constant re-appraisal and use of foresighted policies in a speech before the Advertising Club of Washington recently.

"Airports represent one problem, and air traffic control systems now in use are as obsolete as a pair of high-buttoned shoes," he asserted. As an illustration of the speed with which air transportation is outmoding prewar facilities, he said that the Washington National Airport, only three years old, already is inadequate in many respects.

A strong aircraft industry manufacturing industry, capable of instant quantity production of the best planes in the world, is our best insurance against future Pearl Harbors, Monro declared. He made clear that he was not espousing the cause of the aircraft manufacturer, and added: "The cause of a sound, progressive and highly developed aircraft industry is the cause of all aviation, with a direct bearing on every citizen."

Syracuse Professor Heads N. Y. Aeronautics Bureau

Dr. Leslie A. Bryan, professor of transportation at Syracuse University, has been appointed director of New York's Bureau of Aeronautics in the Department of Commerce. Bryan has taken a leave of absence from Syracuse. He will receive a salary of $6500 as Director of Aeronautics. William E. Cullinan, Jr., former CAA engineer has been appointed as airport engineer with the bureau at a salary of $5200.

THE TEST PILOT'S PASSENGER

BY PHILLIP ANDREWS

Editor and Publisher of "Air News" and "Air Tech" tells how delicate flight research instruments run aircraft "behavior tests" while the pilot flies.

Test pilot Chalmers H. Goodlin and Engineer Stuart K. Edleson talk over a motion picture record of a test flight.

"ONE of the keenest scientific combinations of mechanical brains and eyes is the flight instrumentation equipment designed and built by Bell Aircraft's Flight Research Division. It is the kind of equipment which will assure safer flying for you in the peacetime aviation days to come.

"The test pilot of a high-performance fighter, like the Kingcobra, has no room for extra passengers, nor has he time to record scores of instrument readings himself. But the readings *must* be made—from all parts of the plane—and they must be complete and right.

"So Bell engineers developed their own equipment, smaller than available commercial instruments and capable of installation in half the time.

"From take-off to landing, while the pilot concentrates on putting the plane through her paces—loops, climbs, high-speed runs, breath-taking power dives—these delicate instruments are always at work, recording complicated data on stress, strain, pressure, temperature and all the other things the engineers want to know.

"While all this happens, a movie camera is automatically making a continuous film record, like the one shown in the picture, of all the cockpit panel instruments.

"And when the flying is done, the record is still there, accurate and complete, available for the kind of thorough analysis and study that makes for faster production in the factory and dependable planes in combat.

"Bell Aircraft's emphasis on scientific research and creative engineering has played an important part in the tremendous forward strides of the aircraft industry since the start of the war. And when the day of victory comes, count on this progressive company to pioneer on peacetime aviation horizons."

★ *Buy War Bonds and Speed Victory* ★

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B-29 Boeing Designed Superfortress

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New Air Services

51 Outbound Flights from Boston

Outbound flights from Boston reached a total of 51 last fortnight as new services were inaugurated by Transcontinental & Western Air and United Air Lines, and services were added by Northeast Airlines. Two other airlines—Eastern and American—also serve the New England metropolis. Scheduled flights now go from Boston to New York, Washington, the South, Mexico, the West Coast, Chicago, Northern New England, and Canadian points. Forty go to New York alone, 28 of them non-stop. Northeast has just added nine daily non-stop flights to New York; United has launched a two-round trip a day service between Boston and Cleveland via Hartford, Conn.; and TWA has inaugurated three daily trips to Pittsburgh, one non-stop and two via Albany, N. Y., and Williamsport, Pa.

NWA to N. Y. June 1

Northwest Airlines will inaugurate service on its Milwaukee-Detroit-New York extension on June 1 completing the fourth coast-to-coast route in the country. Schedules calling for four daily round trips between New York and Minneapolis-St. Paul with stops at Detroit and Milwaukee have been submitted to CAB for approval. More flights will be added when additional equipment is available. Northwest will use 21-passenger DC-3 planes with flights from New York to Seattle in 17 hours 20 minutes.

West Coast-to-Oklahoma

New schedules offering direct service from the West Coast to Oklahoma City and Tulsa became effective last month when American Airlines started operating Flagship service over its recently acquired Oklahoma Route. Revision of tariffs as a result of the shortening of the route will materially reduce passenger fares to the Oklahoma cities, A. R. Bone, Jr., American Airlines Western Region vice-president, announces. The new tariffs provide a further saving of $10.50 to Oklahoma City and $7.10 to Tulsa from Los Angeles. Proportionate savings are made in the fares from San Diego to the Oklahoma Cities.

Route 69 Opened

The CAB has notified Northwest Airlines that the national defense no longer requires that service over Route 69 need be delayed, thus permitting operation of the country's fourth transcontinental route. Route 69, recently awarded to Northwest, runs from Minneapolis-St. Paul to New York, via Milwaukee, Wis., and Detroit.

CMA (Mexicana de Aviacion, S. A.) recently began service on a new route, Tampico-Victoria-Monterey.

Aeronaves de Mexico, S. A., has begun service between Hermosillo and Nogales, Mexico, as an extension.

Lamsa (Lineas Aereas Mexicanas, S. A.) has concluded an interline traffic with Pan American Airways.

PCA in Ritz Towers

Pennsylvania-Central Airlines has acquired space for a ticket office and traffic headquarters in the Ritz Towers Hotel at 57th Street and Park Avenue, New York City. These facilities will augment the ticketing and reservations unit now being established in the Airlines Terminal Annex on 42nd Street, New York.

Prepared by
AMPHENOL'S
Expert Staff of Research, Electrical and Plastic Engineers

Complete data is available on Amphenol's cables for the latest requirements—incorporating the solid, flexible, low-loss, mechanically stable, thermoplastic polyethylene.

Explanatory charts and technical information given on Amphenol precision-engineered manufacturing methods. The information contained in the new catalog Section "D" has been compiled thru the close cooperation of Amphenol Engineers, Army-Navy Engineers and large industrial concerns.

This explains why Amphenol U.H.F. Cables embody the same built-in quality, perfection and performance that typify every Amphenol-Engineered product.

For quick reference there is also included a complete chart listing Amphenol cable sizes, characteristics and dimensions as approved by Government Agencies.

Send today for your copy of catalog Section "D" covering the details of High Frequency Cables and Connectors. Use the coupon!

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(B)

Faster..Farther..

Higher..

On SILVER BEARINGS

LONG before the Superfortress could command the airways, many technical problems had to be solved. Among these was the perfection of master rod bearings—bearings capable of withstanding *great* pressures created by huge Wright Cyclone engines.

Over a quarter of a century of metallurgical experience helped Mallory to enter this breach. Silver was selected as an ideal metal, combining durability with anti-friction qualities. This was applied, by the Mallory electroplating process, to backings of base metals. Then precision manufacturing methods were brought to bear so that tolerances were kept to split-thousandths of an inch. Result: bearings that withstand the worst stresses and strains that 2200 horsepower engines are able to inflict.

Like Mallory Precision Bearings for other military aircraft, Superfortress bearings are manufactured in quantity production. Yet so uniform is the finished product that no machining operations are necessary after assembly.

As Mallory metallurgical skill has met the demands of war, so it will be ready for the needs of peace. Here we have the facilities and experience to put sleeve type bearings to unusual use. We especially welcome the "difficult" problem and will be glad to plan *now* for that post-war product. For more information about Mallory Precision Bearings, write for Form B-1000.

P. R. MALLORY & CO., Inc., INDIANAPOLIS 6, INDIANA

P. R. MALLORY & CO. Inc.

MALLORY PRECISION BEARINGS

FOR AIR COMPRESSORS · AIRCRAFT, AUTOMOTIVE AND DIESEL ENGINES · ELECTRIC GENERATORS AND MOTORS · ELEVATORS · FANS AND BLOWERS · GOVERNORS · HOME APPLIANCES · MACHINE TOOLS · PUMPS · RAILROAD EQUIPMENT · ROLLING MILLS · STATIONARY AND PORTABLE ENGINES · STOKERS · TURBINES

2-Ton Air Express Shipments Avert Lay-off of 600 men

SIX HUNDRED hard-to-get skilled workers are assembled for an experimental war production job. The supplier of special fasteners needed for the job can deliver only a limited number at a time. Does this mean a lay-off? No. The manufacturer orders a steady day-by-day flow of the units via Air Express to meet daily requirements and until there's a backlog in the warehouse.

COST is insignificant compared with results achieved ($800 Air Express charges for thirty different shipments totaling two tons). Over 600 men are kept steadily at work — to say nothing of avoiding other losses when a war plant shuts down.

SHIPMENTS, large and small, are often delivered *same day* as ordered from points 500 to 1,500 miles away. When time means money, Air Express saves both. Every business can use this *fastest delivery* with economy.

Specify Air Express — Low Cost for High Speed

25 lbs., for instance, travels more than 500 miles for $4.38, more than 1,000 miles for $8.75, more than 2,000 miles for $17.50, at a speed of three miles a minute -- with cost including special pick-up and delivery in all U. S. cities and principal towns. Same-day delivery between many airport towns and cities. Rapid air-rail service to 23,000 off-airline points in the United States. Direct service to scores of foreign countries.

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Write Today for "Quizzical Quizz," a booklet packed with facts that will help you solve many a shipping problem. Railway Express Agency, Air Express Division, 230 Park Avenue, New York 17. Or ask for it at any Airline or Express office.

Phone RAILWAY EXPRESS AGENCY, AIR EXPRESS DIVISION

Representing the AIRLINES of the United States

CAB Roundup

Southeastern Case May 28

Hearing in the CAB's Southeastern States case (Docket 501 et al) will be held May 28 in Greensboro, N. C., according to the pre-hearing conference report of Examiners Ross I. Newmann and Curtis C. Henderson.

The applications of some 48 applicants have been consolidated for the hearing. They are as follows (parenthetical figures are the consolidated docket numbers):

Aero Pickup Service (501), All American Aviation (1738), All Virginias Air Feeder Lines (1132), American Airlines (1766), Atlantic and Carolina Airways (1332), Blue Ridge Air Lines (1094), Braniff Airways (1718), Carolina Air Lines (1655), Carolina Airways (1139), Chicago and Southern Air Lines (1767), Colonial Airlines (1768), Commonwealth Air Transport (1350), Consolidated Bus Lines (1020), Cotton Belt Airlines (1472), Delta Air Corp. (1708, 1720), Eastern Air Lines (1128, 1278, 1505, 1671, 1723), Gillespie Airways (1081), Angeline Harris (898), Hawthorne Airways (1243), W. A. Hunter, Jr. (1339), Kentucky-Tennessee Airlines (929), Logan Williamson Bus Co. (960), Lovett and Hutcheson (1639), McLendon and Blount (1559), Mountain Airways (1122), National Airlines (1771, 1196, 1722), Pennsylvania-Central Airlines (649, 665, 1772, 1730, 1732, 1733, 1734, 1735, 1737), Piedmont Aviation (1422), Prairie Airlines (1611), Seaboard Air Transport (927), Service Stages (1358), South East Airlines (1655), Southeastern Air Express (1773, 997), Southern Airways (1774, 1271), Southern Aviation Corp. (540), Southland Airlines (1701), State Airlines (1114, 1711, 1776, 1723), Stuart and Sons (1777), Transcontinental & Western Air (1038), Trans-Eastern Airways (1667), Tri-State Transit Co., of Louisiana (1779), Union Airways (1780), Virginia Central Airlines (870), Virginia Stage Lines (1745).

NAL Asks Dismissal

National Airlines has filed a motion with the CAB asking that its application between Jacksonville, Fla., and Kansas City, Mo., be dismissed. The motion points out that air service will be available from Kansas City to all Florida points over the new route of Mid-Continent Airlines from Kansas City to New Orleans, and from New Orleans to Florida points via National. National's application (Docket 1107) was filed in Oct., 1943.

Public Counsel Recommendations

Public Counsel Harry A. Bowen and Robert B. Hankins, in a brief in support of exceptions to the examiners' report, have made the following recommendations in the CAB's Latin American case (Docket 525 et al):

(1) Approval of Panagra's proposed express operations (Balboa, Guayaquil, Lima, Antofagasta, Buenos Aires); (2) extension of Panagra's route from Buenos Aires to Montevideo; (3) inclusion of Sao Paulo, Brazil, as an intermediate point on Pan American's route PAM-3 (a) between Rio de Janeiro and Porto Alegre; (4) extension of Pan American's route PAM-5 from San Juan, P.R., to New York, via Washington; (5) inclusion of Santiago between Miami and Port au Prince on Pan Am's route PAM-3 (a); (6) substitution of Caracas, Venezuela, for La Guaira, Venezuela on Pan Am's route; (7) certification of American Export to operate between New York and Caracas, via Washington and San Juan; (8) certification of Eastern to operate between Miami and Balboa, C. Z., via Kingston, Jamaica;

(9) Permanent certification of Pan American to operate between New Orleans, La., and Guatemala City, via Merida; (10) cer-

BONDS bought these planes.
WASTE FATS helped arm them.
WASTE PAPER helped ship them.
GASOLINE flies them.
WILL YOU help deliver the next squadron?

Jack of all Raids

Target of opportunity, the long suit of any B-25 Mitchell, and when the target does not readily present itself, you can depend on American pilots to make the opportunity. Whether it's a bombing mission requiring pinpoint precision or busting up a jungle troop concentration with lawnmower efficiency, the B-25 takes them all in stride. To the Japs, this rugged plane is nicknamed The Flying Pillbox; to American pilots, it's the work horse of the Army Air Forces.

THREE MODELS OF THE B-25 MITCHELL—EACH DESIGNED FOR A SPECIAL TYPE OF COMBAT OPERATION

PINPOINT

This is the bomb-sight nose of a B-25 Mitchell. This model is used for pinpoint precision bombing from medium altitudes.

PENETRATION

B-25 Mitchell with eight 50-caliber machine guns in the nose. This model used for penetrating jungle undergrowth.

PUNCH

Famed 75 mm cannon nose of the B-25 Mitchell delivers knockouts to pillboxes, punches holes in Jap communications.

North American Aviation *Sets the Pace*

PLANES THAT MAKE HEADLINES... *the P-51 Mustang fighter (A-36 fighter-bomber), B-25 and PBJ Mitchell bomber, the AT-6 and SNJ Texan combat trainer. North American Aviation, Inc. Member, Aircraft War Production Council, Inc.*

tification of National Air Lines to operate from Miami and Tampa to Key West and Havana; (11) substitution of Balboa for Cristobal on Pan American's route PAM-5; (12) (a) if the Board's route between New Orleans and San Juan is authorized on a temporary basis, Pan American and/or (b) if only the New Orleans-Havana segment is authorized, Delta Air Corp; (13) the permanent certificate of American Airlines between Ft. Worth-Dallas and Mexico City, via Monterrey; (14) in the event Braniff's application for acquisition of Aerovias Braniff is approved in whole or in part, the certification of Braniff to Nuevo Laredo; in the event the application is denied, the certification of Braniff to operate between Laredo and Mexico City, via Monterrey, with a restriction that flights originate and terminate at Texas points; (15) certification of Pan American between New Orleans and Mexico City; (16) if the Board reaches a permanent solution of the Los Angeles-Mexico City route, Western Air Lines should be certificated, but if a temporary solution is reached, American's temporary authorization on the west leg of the Los Angeles-Mexico City route (via El Paso) be continued.

Waterman Files Motion

Waterman Steamship Co. has filed a motion with the CAB asking that those portions of the exceptions to the examiners' report and the brief of Eastern Air Lines in the Latin American case dealing with service between the U. S. and San Juan, P. R., be stricken. Waterman's action was based on the allegation that Eastern had abandoned any applications from points in the U. S. to San Juan, and that the air carrier had no application in support of its request for a route between those points. Waterman held that Eastern was making "false representations" in its exceptions and brief, and that no evidence had been submitted at the hearing in support of Eastern's proposed U. S.-Puerto Rico route.

AMEX Asks Postponement

American Export Airlines has filed a motion asking that the CAB postpone its decision on the New York-Puerto Rico route in the Latin American case (Docket 525 et al) and consolidate this proposal with the South Atlantic case (Docket 1171 et al) for decision.

Tiny Electrical Device Tells Pilot in Advance That Engine May Fail

A new type electrical instrument small enough to fit into a man's coat pocket which tells pilots in advance whether they are going to encounter engine trouble has been developed by William Ehlers and Lawrence Bordelon, research engineers at the Consolidated Vultee Aircraft Corp.

Technically known as an engine performance indicator, the new device is installed adjacent to the carburetor of an aircraft engine and measures the lateral distance which the engine is displaced when the propeller is rotating. If the engine is functioning normally, the instrument actuates a gauge in the pilot's compartment and shows how much horsepower the engine is putting out. Then if the engine begins to act up, the gauge needle oscillates accordingly and a warning light glows on the instrument panel, giving the pilot plenty of time to cut the engine and feather the propeller.

New $500,000,000 Financing by Airlines Predicted in 'Airline Finance' Study

NEW FINANCING of $500,000,000 by the country's commercial airlines in the next five years is predicted in a study, "Airline Finance," conducted by a group of banks and life insurance companies. The report is the first of a continuing study of airline financing methods.

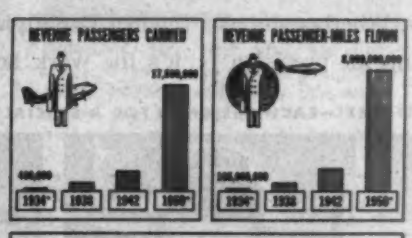
The report, in outlining the dimensions of the financing problems involved, states that by 1950, it is probable that the domestic airlines will fly annually some 8 billion passenger miles, compared with 1.6 billion in 1943, and that gross operating revenues of the airlines by 1950 will reach $500,000,000, compared with $152,000,000 last year.

The survey stresses the great need that will exist for new flying equipment in the postwar period, indicating that "in order to carry the traffic projected for 1950, the domestic airlines will have to have equipment with approximately five times the seating capacity of their existing fleet."

This will require expenditures for flying equipment and spare parts of approximately $300,000,000, the report says, and an additional investment in non-flying equipment, such as hangars, maintenance equipment, communications and office facilities, of over one-third that figure. The airlines will also need additional working capital to cover these expanded requirements, the survey says.

The study also indicates that although the pattern of international air transport is not entirely clear at the moment, it is probably safe to assume that U. S. airlines will spend another $250,000,000 on their foreign operations, or a total of $750,000,000 in all. Of this amount, it is estimated that about $500,000,000 will have to be raised by borrowing or through the sale of equity securities.

The study was made jointly by Bankers Trust Co., the Mutual Life Insurance Co. of New York, the Chase National Bank and the New York Trust Co., and was conducted under the supervision of Gordon D. Brown, independent consultant on aviation problems.



The Future of Air Transport, as shown by a survey conducted by Bankers Trust Co., Mutual Life Insurance Co. of New York, Chase National Bank, and New York Trust Co. All figures are for United States domestic airlines.

Essair's Chief Pilot Honored for Training 2200 British Flyers

When Essair, Inc., starts airline operations in Texas later this month or in June it will have as its chief pilot a flight supervisor who has been decorated by the British Empire.

E. Van Lloyd, Essair chief pilot, was made an Honorary Member of the Civil Division of the Most Excellent Order of the British Empire April 17. The award was made at the British Embassy in Washington by Lord Halifax in recognition of services to the Royal Air Force. Van Lloyd has been supervisor of flight for British Flying Training School No. 1 at Terrell, Texas, where he has been in charge of training a total of 2200 British pilots since 1941.

'Thank You Sir'— E. Van Lloyd, flight supervisor for British Flying Training School No. 1, Terrell, Texas, (left) is shown thanking Lord Halifax after being made Honorary Member of the Civil Division of the Most Excellent Order of the British Empire.

A like award was presented to Anthony (Tony) J. Ming of British Flying Training School No. 3 (Spartan School of Aeronautics), Miami, Okla. The six British schools in the United States, three of which still are operating, have graduated 15,000 pilots.

Essair has two of its three nine-passenger Lockheed Electras ready for operation, except for some radio and instrument installations. The 700-mile Essair route will link Amarillo and Houston with one round trip daily at the start of operations.

ATC "Skyloader Tactics"

will be vital to peacetime air transport

Loading crews of the Army Air Forces Air Transport Command are regularly instructed in all the uses of Skyloader equipment. For the ATC counts "Skyloading" a vital factor in insuring safe arrival of both crews and cargoes.

With Evans Skyloader tie-down equipment, all kinds, shapes and sizes of freight become *actual parts of the plane*—and are carried without risk to the crew or plane. Skyloader equipment saves on-and-off loading time and is so simple in operation that its proper use is quickly learned by the most inexperienced personnel.

Evans Sky Products are so planned that transport planes can be fitted with Evans litter stanchions, seats, cargo holddown kits, and floors, and then used for one or more purposes simultaneously.

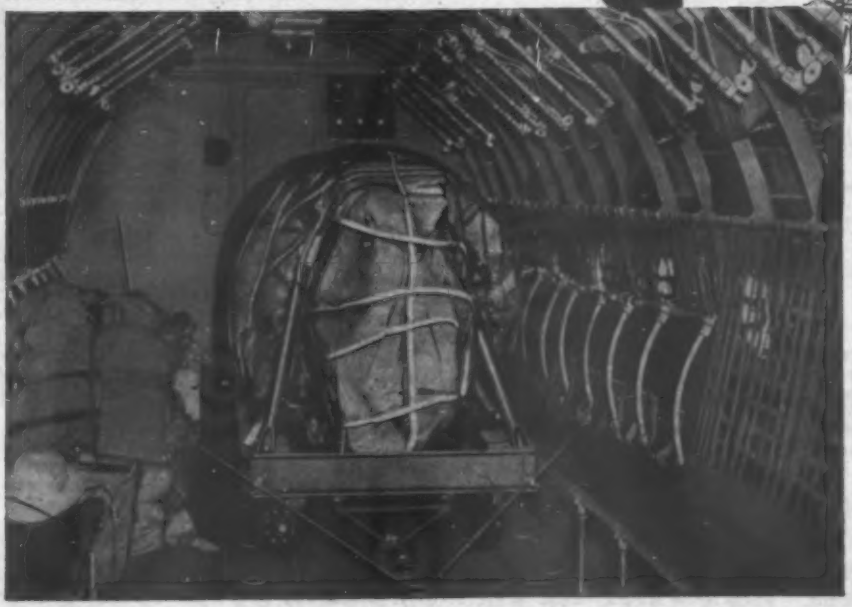
Evans engineers are planning today for even greater progress in Sky Products in the future. For the ATC men now at war will carry over the certain value of "Skyloader Tactics" to the air transport of a world at peace.

SKY PRODUCTS DIVISION

EVANS PRODUCTS COMPANY

DETROIT 27, MICHIGAN

AN AAFATC TRANSPORT PLANE WITH EVANS SKY PRODUCTS EQUIPMENT



1 Sky Litter stanchions and supports folded back.

2 Sky Seats folded back.

3 Sky Seat ready for use.

4 Rod-and-hook tie-down equipment in use.

5 Evans Sky Floor with sockets for litter stanchions and rings for Skyloader hooks.

6 Rope tie-down equipment in use with other cargo.

Limited Production OK'd

A limited production of transport aircraft for civilian use was authorized May 8 by the Aircraft Production Board. J. A. Krug, APB chairman, sent a letter to manufacturers advising them that production of air transports for American air carriers is considered a war-supporting activity. He advised that aircraft, aircraft engine, propeller and aircraft component manufacturers may build equipment for sale to American air carriers, provided there is no interference with military production. He further advised that manufacturers must obtain agreements from the procurement agency and the DPC before government-owned equipment and facilities or materials are used for this purpose. It was also pointed out that military services can not afford Selective Service protection for commercial air transport work and that manpower problems relating to such work must be handled with the War Manpower Commission. Non-vulnerable employes must not be transferred to commercial air transport work.

SPB Transport Plane Allocations Reach 199

The Surplus Property Board, in its 11th allocation of surplus transport planes on April 25, allocated 12 planes, but eight of them were re-allocations because of rejections from applicants because of types of engines or the general condition of the planes.

This brought the total of surplus transports so far allocated under surplus property procedures to 199, of which domestic applicants have received 122 and foreign applicants 77.

Domestic Applicants

Douglas (DC-3 type)

American Airlines	1
Pennsylvania-Central Airlines	1
	2

Lockheed (Lodestar type)

Kollsman Instrument Div., Square D Co.	1
Page Airways	1
Skyways International Trading and Transport Co.	1
Trans-Marine Airlines, Inc.	1
	4

Foreign Applicants

Secretariado Aviacion Civil (Portugal)	3
Ministry of War and Navy of Venezuela	1

In addition the allocation of five smaller transports was announced. They are not included in the transports listed above. They follow: AT-7 (Beech), McCullough Tool Co., 1; AT-11 (Beech), Specialties, Inc., 1; UC-64 (Noorduvn), All American Aviation, 1; Lockheed Electra, Essair, Inc., 1, and Noble Drilling Co., 1.

Among the airlines which turned down planes allocated previously were Woodley Airways of Alaska, Canadian Pacific Air Lines, Ltd., and a Norwegian applicant. Except for one Aircraft Service Operator, other rejects came from industrial firms.

Civilian Commentary

DEAR E. B.:

Your letters to the staff from far-away India and Burma have been enjoyed by all hands, but we're hoping you'll resume writing for this column and let others enjoy your descriptions of life in the Far East.

Meantime, I'll do my best to fill in with some chit chat in connection with the International Air Transport Conference at Havana a few weeks ago.

For one thing, there is no secret any more about O. M. Mosier's middle initial. The vice president of American Airlines had to give his full name for his passport but had hoped that the long-time secrecy of the middle initial would remain intact. But the Cuban immigration official at Havana Airport began calling for a Mr. McKinley and when no one stepped up, the official then called for Mr. McKinley Mosier using the French pronunciation. The jig was up. O. M. Mosier is Mr. Orval McKinley Mosier.

M. F. Redfern, secretary of the Air Traffic Conference, will never live this one down: he decided to give a cocktail party in his suite at the Nacional Hotel. He ordered canapes and all the usual plush service that goes with a deluxe affair. He invited many guests. Then he promptly forgot about his own party, went out to dinner and arrived back at his rooms after midnight to find everything waiting—except the guests. They had departed from the locked door long previous. What should be done about a guy who forgets his own party?

The Havana Post, an English-language newspaper with the world's most atrocious and fascinating English, got top billing at the conference on the opening day when it listed as having arrived at Havana a long list of aviation delegates. Included in the list was the following:

". . . and Eddie Rickenbacker, he who was himself attentive to a gold cross hanging from his neck when, if not, in deep water-in the boat, diminutive rubber one, lost in the ocean, with all alive here and everywhere praying for him, and the rest of the crew, in safety. He himself is to join all others now on a prayer for Roosevelt. Rickenbacker and a number of others with him and out of him are here to be in commercial aviation meeting. Guests are also M. F. Redfern, familiar; T. B. Wilson, compound words of a title left in the pen; T. E. Braniff, familiar prospect . . .etc."

So help us, the above is correctly reproduced.

Pan American's good Miami-Havana service is noteworthy for the frozen daiquiris served to passengers on arrival at the PAA airport at Havana, and for the very delicious coco glace (cocoanut ice cream served in a hollowed-out half cocoanut) served on Miami-bound flights. PAA took excellent care of all delegates on both north and south-bound trips.

Eastern deserves a pat on the back, too, for doing an excellent handling job for delegates. An orchid also to Harry Knapp, EAL's dtm at Washington, and to Tom Caldwell, EAL's long-time, experienced and transport-wise major domo at Miami, for lots of things.

Miami is no place for a vacation in these days of hotel shortages and Navy training in the center of town, but the airlines are getting spruced up for postwar business. PAA has a prominent location and a very fine ticket office and customs layout, which is managed by John Rogers. Right on Biscayne Boulevard, you can't miss it. It's built for volume handing. As evidence of this, PAA cleared 5500 passengers and 15,000 pieces of baggage thru its downtown office in a recent month.

EAL is blossoming out in a way that evidently presages a new era of traffic and sales expansion for the company. It has taken the whole corner of the Columbus Hotel location on Biscayne and has built one of the handsomest airline offices of all times. It's a knock-out. It's not ultra-modernistic, yet it is modern in a sensible degree. We'd class it as one of the top five layouts in the business.

National and TACA are also well situated, but with smaller offices. I gather from talking with John Rogers and Tom Caldwell that very heavy business is anticipated after the war, and present plans are based on volume handling above everything else.

Incidentally, PAA's handling of its international passengers is worthy of favorable comment. There's an awful lot of wartime red tape that would drive a domestic operator nuts. But PAA handles it with as much efficiency and dispatch as one could expect; in fact you can go further and say it's better than one would expect, considering all of the governmental handicaps.

Out at the Pan American Airport on 36th Street, I had the pleasure and privilege of meeting and talking with John Donahue, PAA station manager, who has been 17 years with PAA and began his aviation career back in 1921 with the late and great Ed Musick when Aero Marine began flying between Miami and Key West. Donahue can hardly

Our Post-War Policy in one word*

"AVIATION!"

The Doak organization was born in aviation *of* aviation long before Pearl Harbor. All of our key personnel have at least 15 years experience in aircraft production. We believe in aviation. It is the most dynamic force in transportation today.

We, therefore, are not thinking or planning in the usual conversion or "reconversion" terms. We believe that the industry is going to need more than airframe manufacturers in the competitive era; that it will need men with specialized skills and specialized machinery.

The Doak plant is a self-contained metal working factory, with complete processing departments. We entirely manufacture in our own plant complete parts and assemblies which now fly on all fighting fronts with our airmen.

E. R. Doak

E. R. DOAK, President

DOAK AIRCRAFT CO., INC.
TORRANCE, CALIFORNIA

*WE DO NOT INTEND TO MANUFACTURE REFRIGERATORS, VACUUM CLEANERS, ROWBOATS, CAN OPENERS OR EGG BEATERS.

believe the development in the business since 1921. He shakes his head a little incredulously, and doesn't think the airplane is here to stay. He's seen a lot of changes, Donahue has.

The IATA got off to a good start in one way, at least, by opening the full meetings to the press. I understand Dr. Luis Machado, of Expreso Aereo Interamericano, and John C. Cooper, PAA's vice president, had something to do with lifting the secrecy. A fine move. We hope all IATA meetings remain open similarly.

Here's an anniversary of note: L. F. Bouman, New York manager of K. L. M., Royal Dutch Airlines, celebrated his 20th year with K.L.M. on April 7. Match that, can you?

And in far-off China, or wherever you are, you might like to know that an old school pal of yours (Northwestern U.), Johnny Grandland, who is traffic rep. for EAL at Miami, sends his regards to you.

W. W. P.

Aerovias Azteca Reorganized

The new Mexican airline, Aerovias Azteca, is undergoing a complete reorganization and may have to apply again for permits initially granted by the Mexican government for extensive air operations in Mexico, it is learned.

Warner Honored

Edward P. Warner, vice chairman of the Civil Aeronautics Board, has been elected as one of the three vice presidents of the Harvard Alumni Association to serve for the coming year. Warner was graduated from Harvard in 1916.

Fair Labor Test Suit Filed Against NWA

A suit to recover $1,900,000 from Northwest Airlines under the time-and-one-half provisions of the fair labor standards act of 1938 was filed in Federal Court in St. Paul, Minn., last month in behalf of a former Northwest employe and approximately 3000 others.

The complaint named David J. Jackson of St. Paul as the chief plaintiff, but the suit stated that it "is of common and general interest to all employes and former employes of the defendant." The complaint asked damages "in excess of $100," Jackson alleging that he had worked as a time clerk for the airline and was not paid time and one-half for overtime after 40 hours of duty. Jackson left Northwest's employ March 28.

Sturges Successor Named

Miss Bernadine Baker has been appointed acting director of public relations and advertising for Southwest Airways.

Airline Mileage, Traffic, Revenue and Expense Statistics

The following tabulations are from preliminary reports issued by the Civil Aeronautics Board, as obtained from monthly Form 2780 reports from the domestic airlines to the CAB and from estimates when data are not available.

Final and authentic tabulations from Form 2780 reports, often not available until some months after the preliminary CAB reports, are published regularly by *American Aviation Reports*, American Bldg., Washington 4, D. C.

Because of space limitations, certain traffic and expense categories are not included in the following tables.

OPERATING REVENUE AND EXPENSE FOR YEARS 1944 AND 1943

		OPERATING EXPENSES						
		Passenger	Mail	Express and Freight	All Other	Total	Total Operating Expense	Net Revenue from Operations
All American	1944	$.....	$558,430	$ 7,453	$ 5,004	$ 570,887	$ 590,176	$ —19,290
	1943	.....	325,621	10,579	11,868	548,068	521,758	26,310
American	1944	29,338,231	6,685,282	2,529,922	690,577	39,244,012	29,772,550	9,471,462
	1943	23,356,327	4,886,389	2,580,563	628,152	31,451,430	22,987,011	8,464,419
Braniff	1944	4,760,647	678,528	152,737	112,945	5,704,855	4,477,141	1,227,714
	1943	3,419,930	699,593	197,766	136,969	4,454,258	3,531,118	923,140
Chi-Sou	1944	2,501,636	281,808	107,245	56,024	2,946,713	2,729,533	217,180
	1943	1,831,359	301,823	96,665	38,482	2,268,329	2,243,673	24,656
Colonial	1944	950,548	126,396	24,785	27,746	1,139,475	1,146,021	—6,546
	1943	628,453	138,902	15,550	14,590	797,495	809,860	—12,365
Continental	1944	1,173,335	651,335	19,070	22,219	1,865,959	1,885,092	—19,133
	1943	750,803	692,061	12,213	23,675	1,478,772	1,223,007	255,765
Delta	1944	3,253,225	622,059	70,365	99,402	4,045,051	2,851,885	1,193,166
	1943	2,145,200	435,670	68,378	59,309	2,708,557	2,213,736	494,821
Eastern	1944	Data not available due to carrier's delinquency in filing Form 2780 report for Dec., 1944						
	1943	12,010,467	2,599,200	743,707	428,014	15,781,388	10,730,868	5,050,520
Hawaiian	1944	1,276,146	10,183	389,343	53,535	1,729,107	1,406,910	322,197
	1943	1,241,970	15,259	340,209	15,635	1,613,073	1,183,784	429,289
Inland	1944	378,369	455,250	3,281	23,399	860,299	912,362	—52,063
	1943	201,305	319,050	1,893	11,501	533,552	512,536	21,016
Mid-Continent	1944	Data not available due to carrier's delinquency in filing Form 2780 report for Dec., 1944						
	1943	520,726	614,170	12,264	10,701	1,157,861	973,830	184,031
National	1944	1,939,263	245,903	37,041	33,164	2,255,371	2,285,907	—30,536
	1943	1,171,483	210,287	19,456	36,904	1,438,130	1,425,106	13,024
Northeast	1944	750,985	316,438	9,140	9,408	1,084,971	1,089,968	5,003
	1943	533,963	283,249	8,080	10,760	836,052	906,095	—70,043
Northwest	1944	6,073,988	1,469,001	246,090	134,887	7,923,886	7,482,592	440,994
	1943	3,139,714	1,321,464	297,941	166,991	4,926,110	4,305,236	620,874
Penn-Central	1944	5,571,117	370,138	212,343	121,326	6,274,924	5,457,944	816,980
	1943	3,249,282	299,764	243,583	122,205	3,914,834	3,479,868	434,966
TWA	1944	17,576,461	5,653,224	1,618,471	425,304	25,273,460	19,990,583	5,282,877
	1943	12,902,860	4,290,545	1,539,262	432,978	19,165,645	15,861,932	3,303,713
United	1944	22,474,968	10,742,709	1,895,657	543,631	35,629,965	24,289,817	11,340,148
	1943	18,473,916	6,316,211	2,063,393	797,025	27,650,545	20,383,979	7,266,566
Western	1944	2,884,211	518,259	102,567	156,570	3,661,607	3,273,360	388,247
	1943	1,709,402	260,906	114,650	76,495	2,161,453	2,054,585	106,868
Total[1]	1944	115,782,567	33,314,755	8,216,218	3,861,502	160,175,042	124,260,818	35,914,224
	1943	87,287,163	24,210,184	8,365,951	3,022,254	122,885,552	95,347,972	27,537,580
Eastern	1944	13,861,812	3,006,521	771,765	327,792	17,967,891	12,928,568	5,039,323
Mid-Continent	1944	1,035,645	913,293	19,163	18,568	1,986,609	1,690,149	296,460

[1] The total of all carriers for the 12 months ended December 31, 1944, reflects data for the 12 months ended Nov. 30, 1944, for Eastern and Mid-Continent due to non-receipts of reports for Dec., 1944.

Source: Carriers' monthly Form 2780 reports.
Subject to correction.

Fiberglas-plastics fabrications by United States Rubber Company for Nash-Kelvinator Corporation.

FIBERGLAS*- REINFORCED PLASTICS

—a spectacular, new, lightweight

Structural Material

Aircraft structural parts, such as the cabin structure of the Army R-6 Helicopter, are now being made of plastics reinforced with Fiberglas — fine filaments of glass woven into cloth, then used with low-pressure resins in the fabrication of extremely strong, lightweight laminated plastics parts.

Fiberglas textiles are resistant to moisture, therefore are dimensionally stable. They possess great tensile strength, and are resistant to heat, oils, corrosive vapors and most acids.

The combination of Fiberglas and certain low-pressure resins has resulted in a material with properties which excel those of any material previously available for commercial use. For example, impact strength from five to ten times that previously obtained in laminates is now attained through Fiberglas reinforcement. Higher strength-to-weight ratios, greater rigidity, dimensional stability and simplified fabrication are but a few of the advantages which are resulting in the rapidly increasing use of Fiberglas for reinforced plastics sheets and formed parts.

Samples and complete information on Fiberglas Textiles will be sent to you on request. Owens-Corning Fiberglas Corp. does not manufacture resins or finished laminates but will be glad to furnish data on techniques in the use of Fiberglas and low-pressure resins. Write: *Owens-Corning Fiberglas Corp., 1894 Nicholas Bldg., Toledo 1, Ohio. In Canada, Fiberglas Canada Ltd., Oshawa, Ont.*

Fiberglas—glass in the form of fine fibers—twisted into yarn and woven into cloth, possesses many of the properties most sought after in low-pressure laminates.

R-6 cabin structure of Fiberglas-reinforced plastic being trimmed and made ready by U.S. Rubber for shipment to Nash-Kelvinator.

The R-6 Helicopter which will be used to transport wounded from inaccessible combat areas and will service military outposts with supplies.

ARMY E NAVY

FIBERGLAS .. A BASIC MATERIAL

*T. M. Reg. U. S. Pat. Off.

OPERATING REVENUE AND EXPENSE FOR DEC., 1944 AND DEC., 1943

		OPERATING REVENUE						
		Passenger	Mail	Express and Freight	All Other	Total	Total Operating Expense	Net Revenue from Operations
All American	1944	$	$38,753	$ 364	$ 697	$ 39,816	$ 52,534	$ —12,718
	1943	.....	41,813	—98	166	41,881	42,859	—978
American	1944	2,568,030	718,153	259,416	49,297	3,594,896	3,188,496	406,399
	1943	1,763,607	499,193	156,372	65,627	2,484,799	2,487,885	—3,086
Braniff	1944	406,701	61,261	19,286	12,902	500,240	526,936	33,496
	1943	293,910	65,365	3,815	13,377	376,467	387,791	—11,324
Chi-Sou	1944	205,896	24,421	10,563	10,563	251,333	288,195	—36,862
	1943	141,805	22,418	—784	—4,461	158,978	237,405	—78,427
Colonial	1944	84,554	10,844	2,100	3,315	100,813	126,447	—25,634
	1943	55,002	11,718	2,346	1,497	70,563	67,652	2,911
Continental	1944	112,629	52,437	1,910	3,002	170,578	193,789	—23,211
	1943	52,963	53,056	2,586	1,624	110,229	116,756	—6,527
Delta	1944	289,987	66,633	8,531	8,766	373,917	322,381	51,536
	1943	215,358	47,127	5,026	6,634	274,145	232,565	41,580
Eastern	1944	Data not available due to carrier's delinquency in filing Form 2780 for Dec., 1944						
	1943	974,859	261,468	23,692	28,225	1,288,254	1,290,263	—2,009
Hawaiian	1944	119,598	1,189	36,330	10,703	167,840	207,044	—39,204
	1943	103,214	1,275	35,923	3,732	144,144	171,599	—27,455
Inland	1944	52,360	48,910	389	10,317	111,976	144,803	—32,827
	1943	17,458	28,226	.....	687	46,373	51,773	—5,399
Mid-Continent	1944	Data not available due to carrier's delinquency in filing Form 2780 for Dec., 1944						
	1943	65,656	71,903	1,491	570	139,630	175,534	—35,904
National	1944	203,372	32,869	3,191	4,442	243,874	260,923	—17,049
	1943	96,564	18,245	1,892	4,008	120,509	139,804	—19,295
Northeast	1944	68,226	25,632	835	1,133	95,825	116,618	—20,793
	1943	51,925	24,612	991	—5,333	72,196	107,963	—35,767
Northwest	1944	587,968	139,942	29,641	13,162	770,613	772,815	—2,202
	1943	340,539	128,380	28,769	15,268	512,956	508,833	4,123
Penn-Central	1944	469,519	29,361	16,846	8,308	524,033	608,918	—84,885
	1943	353,101	23,646	19,130	6,396	392,275	466,879	—74,604
TWA	1944	1,384,616	627,349	140,045	19,773	2,171,777	1,947,781	223,996
	1943	933,654	462,978	81,628	12,656	1,490,926	1,834,904	—343,978
United	1944	1,862,433	1,080,822	180,124	36,325	3,159,704	3,026,067	133,637
	1943	1,514,324	673,889	163,575	22,828	2,374,616	2,584,681	—210,065
Western Air	1944	345,977	87,287	10,304	17,594	461,162	379,228	81,934
	1943	163,467	24,826	6,486	—6,645	188,134	220,209	—32,075
Total[1]	1944	10,504,753	3,415,973	814,312	237,094	14,972,132	13,496,288	1,476,844
	1943	7,117,406	2,470,140	532,630	166,860	10,287,065	11,125,354	—838,289

[1] The total of all carriers for the month of December 1944 reflects data for the month of November 1944 for Eastern and Mid-Continent due to non-receipt of reports.

Eastern		1,590,272	289,815	92,251	24,820	1,997,158	1,245,593	751,565
Mid-Continent		92,616	80,399	2,176	1,286	176,477	186,718	—10,241

MILEAGE AND TRAFFIC FOR FEB., 1945 AND FEB., 1944

		MILEAGE				TRAFFIC				
		Scheduled Miles Flown		Total Revenue Miles	Total Miles Flown	Revenue Passenger-Miles	Revenue Passenger Load Factor	Average Revenue Passenger Load	Mail Pound-Miles	Express Pound-Miles
		Percentage	Number							
All American	1945	81.41	89,325	89,408	93,023	.....	.....	.....	8,616,297	1,536,822
	1944	81.23	77,944	77,944	82,702	.....	.....	.....	7,360,734	1,113,485
American	1945	84.71	2,923,430	2,967,356	3,121,250	45,549,500	85.27	16.21	2,063,580,385	1,102,168,650
	1944	84.79	2,019,631	2,060,318	2,117,958	31,196,791	86.80	16.17	1,474,761,700	644,164,961
Braniff	1945	82.61	469,202	470,213	511,202	7,698,883	83.58	16.37	158,043,531	77,294,225
	1944	81.73	301,973	305,381	322,571	4,917,714	92.17	16.10	193,807,447	22,467,048
Chi-Sou	1945	86.77	297,830	299,058	303,340	4,138,025	67.45	13.84	88,601,653	55,508,861
	1944	81.70	157,711	162,066	166,885	2,540,256	79.12	15.67	75,499,915	28,398,613
Colonial	1945	84.35	96,606	96,606	99,274	1,369,222	67.49	14.17	10,846,452	4,268,233
	1944	85.63	49,040	53,534	55,904	853,864	75.97	15.96	8,079,549	3,841,312
Continental	1945	90.51	223,925	224,577	240,671	2,349,388	71.52	10.46	25,801,546	18,698,471
	1944	88.06	117,417	117,417	129,032	1,031,406	81.29	8.78	17,377,048	5,101,834
Delta	1945	87.05	369,862	370,646	381,237	6,150,480	81.60	16.59	207,300,501	38,538,280
	1944	85.28	207,092	207,092	211,888	3,736,648	80.13	18.04	151,821,674	24,735,481
Eastern	1945	Data not available due to carrier's delinquency in filing Form 2780 report for February 1945.								
	1944	83.09	1,057,617	1,061,277	1,083,345	16,035,840	84.63	16.79	756,508,232	212,590,907
Hawaiian	1945	100 00	42,912	76,365	78,995	1,328,163	94.78	22.75	3,609,238	77,145,963
	1944	96.87	42,276	70,920	73,606	1,148,411	91.57	21.96	3,009,508	81,006,127
Inland	1945	97.18	120,056	120,056	125,376	1,282,759	61.22	10.99	9,129,829	1,550,851
	1944	81.50	65,598	65,598	66,537	290,584	65.42	6.82	4,975,103	497,752
Mid-Continent	1945	87.67	193,125	193,125	200,215	1,833,928	58.03	9.50	36,545,858	9,577,117
	1944	94.99	160,602	160,602	165,042	1,323,152	66.57	8.24	38,071,563	3,370,251
National	1945	93.79	348,153	355,022	380,865	4,184,034	91.93	11.79	87,937,942	15,228,948
	1944	92.59	212,591	214,276	221,580	2,530,609	86.77	11.76	47,591,106	8,032,606
Northeast	1945	82.57	96,250	96,442	97,515	1,102,896	52.00	11.44	5,166,750	2,975,896
	1944	74.93	67,595	67,595	72,173	654,387	46.10	9.68	6,226,806	1,800,230
Northwest	1945	93.45	704,730	714,286	728,944	11,100,495	81.48	15.65	391,856,028	147,861,695
	1944	95.28	429,649	430,358	436,193	5,863,358	77.38	13.85	386,979,856	83,238,703
Penn-Central	1945	81.36	595,774	598,918	624,844	8,185,802	68.00	13.67	124,394,589	132,095,065
	1944	81.41	237,159	237,159	239,780	3,795,234	77.16	16.00	93,424,355	51,795,844
TWA	1945	81.83	1,809,939	1,870,226	1,986,621	26,171,963	84.26	15.64	1,996,627,481	738,817,669
	1944	84.10	1,215,316	1,224,103	1,311,676	17,128,587	85.14	15.78	1,079,370,435	370,117,261
United	1945	87.73	2,476,436	2,522,923	2,627,053	33,663,944	93.78	16.19	3,100,519,682	783,316,521
	1944	89.51	1,855,753	1,930,131	1,988,228	28,647,612	94.61	16.94	2,204,973,767	526,515,832
Western	1945	95.39	346,421	350,248	389,472	5,707,738	83.69	16.30	213,447,663	49,505,307
	1944	94.83	186,183	186,183	189,317	3,007,530	83.34	16.15	89,318,521	39,407,511
Total[2]	1945	86.53	13,064,171	13,327,121	13,908,144	192,713,560	83.44	15.61	9,589,366,478	3,651,302,641
	1944	86.45	8,461,147	8,631,944	8,934,430	124,689,013	86.27	15.80	6,639,757,319	2,116,395,848

[1] The total of all carriers for the month of Feb. 1945 reflects data for the month of Jan. 1945 for Eastern due to non-receipt of this carrier's Form 2780 for Feb. 1945.

Month of Jan. 1945:										
Eastern		89.41	1,860,193	1,891,634	1,918,247	30,896,278	84.47	16.78	1,057,341,053	395,214,946
Adjusted total[2]		87.91	14,113,843	14,481,022	15,022,845	209,252,651	83.66	15.54	10,139,482,347	3,483,384,976

[2] This total includes data for Eastern for month of Jan. 1945, not furnished by this carrier in time for the Jan. 1945 Public Release.

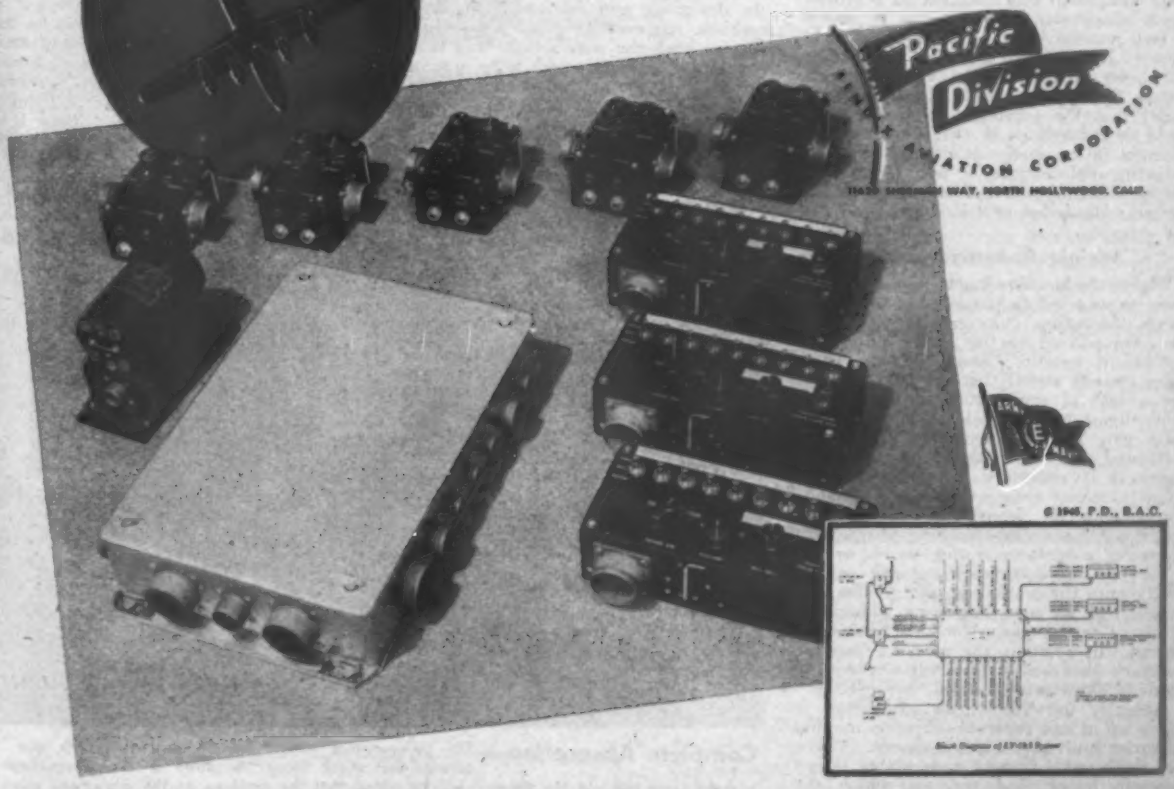
ALL 5

USE THIS STANDARDIZED INTERPHONE SYSTEM

For the first time radio and interphone control systems have been completely standardized for more than one type of aircraft... by Pacific Division. Altair Model LY-10A system is being used on the Lockheed *Ventura*, Martin *Mariner*, Consolidated-Vultee *Catalina* and *Privateer* and the Douglas *Skymaster*. Designed to Navy specifications by Bureau of Aeronautics and Pacific Division engineers, this is a complete system to control all communication and radio navigation equipment in large aircraft.

This feature alone is recognized as an important step forward in aircraft accessory design. Model LY-10A, however, incorporates — also for the first time — the use of isolation amplifiers which eliminate all crosstalk without the use of multiple audio output stages in each receiver. Selection of up to 9 receivers and 3 transmitters at flight deck stations can be provided.

Altair Model LY-10A, which provides a simple control for a large number of complex radio units, is an example of Pacific Division's understanding of a job that could result only from long experience. Pacific Division invites inquiries on any radio problem.



PACIFIC DIVISION, Bendix Aviation Corporation, 11620 Sherman Way, North Hollywood, California. Sales Engineering Offices: Lincoln Building, New York City 17; Continental Building, St. Louis 3.

'Vibrashock' Mount Absorbs 95% Vibration

Device Was Developed Originally to Take Sharper Air Photographs; Being Tested by American Airlines

A SIMPLE DEVICE originally developed to permit the taking of sharper aerial photographs now seems destined to play an important role in increasing the life, dependability and performance of airlines communications equipment and may, in addition, permit weight savings ranging up to 30 percent. Known as the Vibrashock mount, it is now being used extensively by the Army and Navy, and is being tested by American Airlines with Sperry ADF installations.

The principal advantage of the Vibrashock mount over the conventional shock mount is that it is omni-directional and absorbs a higher percentage of airplane and engine vibration over the entire operating range. Flight and laboratory tests have proven this absorption to exceed 95 percent, and there is an almost total absence of resonant frequencies from below 1,800 to above 2,400 cycles per minute—the most critical range as far as aircraft are concerned in that it corresponds to the revolutions per minute range of the propeller.

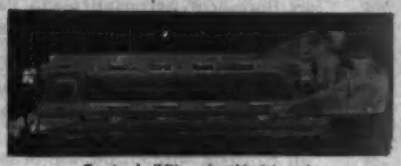
The effect of the new suspensions in increasing equipment life has been demonstrated by Army and Navy experience. On a C-54, for example, several tube failures were experienced with one piece of equipment on every flight. After the same equipment was mounted on a Vibrashock suspension, intervals of as much as two months went by without a single failure. In the Navy, after the new mount had been made standard equipment on certain types of carrier planes, it was found that the carrier maintenance staff could be reduced by several men. And in addition to increasing equipment life and reducing maintenance, it was found that the new suspension actually resulted in higher output for certain types such as the Arc-5.

Weight Reductions Seen

While these advantages alone would seem to warrant airline interest in Vibrashock suspension, even greater gains may be accomplished in the form of reduced equipment weights. Some manufacturers have already stated that they can reduce the weight of transmitters, receivers and other items by as much as 30 percent if they can design them for Vibrashock mounting. This is due to the fact that today it is necessary to design an extremely strong chassis to support certain components on which the acceleration values due to vibration are very high. However, since acceleration varies as the square of the frequency as well as directly with the amplitude, the greater absorption of the new suspension eliminates much of the necessity for this beefed up design. In addition, the need for supplementary shock mounts within the equipment is likewise eliminated.

Actually the Vibrashock suspension is made up of two separate vibration mounts in series built into a single mount. There are three metal frames—base plates, intermediate frame, and tray on which the equipment rests—which are separated by natural sponge rubber cushions and held together by special retaining studs. These studs are riveted into the base and tray plates and float in the middle of soft solid rubber buffers or grommets which are thicker on the side on which the pressure comes in inverted flight. They are held in place by a metal clip and washer. The shock cushions are completely free and are not attached to the metal frames in any way, merely resting in a sort of cup.

The two stage design permits the mount to take care of vibration in any direction



Typical 'Vibrashock' Mount

or combination of directions such as rocking. In addition the degree of absorption in any direction can be controlled within reasonable limits due to the number of things that can be varied. These include the softness, area and shape of the rubber cushions, the spacing of the cushions both in relation to the center of gravity and in relation to each other, and the spacing of the retaining studs.

In designing and manufacturing a Vibrashock suspension it is necessary to consider both the size, weight and center of gravity of the equipment to be mounted, the extent of the control needed, and the frequencies and amplitudes of the vibrations which will have to be absorbed. This requires that the Vibrashock engineers get in on the original engineering of the plane in which the mounts are to be used so that they can design a mount for that specific model of plane. Likewise, it follows that the equipment manufacturer must be in on the design from the beginning so that his equipment and the mount provided for it will be suited to each other.

Robinson Aviation, Inc., which devised the Vibrashock suspension, has many other proposed applications for commercial aircraft in addition to radio and communications equipment. One which has already been tested extensively by the Army is Vibrashock suspension for instrument panels. Here one of the principal advantages to be gained is a reduction in pilot fatigue due to eyestrain. Eliminating vibration in the instrument panel also helps reduce the noise level in the cabin.

One of the most interesting of the proposed applications is the use of Vibrashock suspension for seats, berths and even entire passenger cabins. At present work on this has been held back due to the pressing need for suspensions for Army and Navy communications and photographic equipment, but it holds a high priority on the company's postwar schedule. Still another possibility, also for postwar development, is the use of Vibrashock suspension for engine mounts.

Few Replacements Needed

While the Vibrashock mount offers advantages in the form of lowered maintenance and reduced weight for the equipment it carries, it does not in itself involve any added weight or maintenance burdens over conventional shock mounts. In general, the weight of the Vibrashock and the conventional mount is about the same. As to maintenance, there is the story that the Navy suddenly discovered after two years that it had no spares for a certain type of Vibrashock camera mount, and even then it was purely a clerical discovery, since there hadn't been a single call for replacements. S. C.

Complete Absorption—The comperative absorption of the vibrashock and the conventional shock mount is shown in this photograph of a shake table test. In the photo it will be noted that the mock-up on the vibrashock mount is steady enough to balance a nickel on edge (designated by arrow), while that on the conventional mount is vibrating so much that the scales are not legible.

"My Son has me up in the Air!"

1 **It seems** that my boy in the Air Force has written to the Aeronca people, and he really has me up in the air. He tells me some fascinating things about the personal planes this company will have postwar. He talks about them as he would about a new car . . . big, comfortable lounge-type seats in one model, wing slots in another, and a type big enough for the family at a modest price.

2 **He says** that because Aeronca is 100% on war work now, they've learned as much these last couple of years as they did in more than 16 years of previous experience. They've won the Army and Navy "E" (the only light aircraft company to receive this award). All told, the story sounds like good news for air-minded people. When I write my son about it, he just answers:

3 **"Get on the beam,** Pop! Send for a couple of the booklets these Aeronca people have. One tells about their new personal planes. Another describes their plans for airfields and servicing of planes near home." It sounds as though they're putting personal planes in a class with automobiles. I'm following my boy's advice and sending for the booklets. Why don't you?

AMERICA'S PERSONAL PLANE

AERONCA

has an important message for air-minded people

Aeronca Aircraft Corporation, Middletown, Ohio
Department AA-515

Send me your valuable booklets. Enclosed is 10c for each booklet.
(Check)

_____"Aeronca—the Plane You'll Want to Fly"
_____"How to Make Small Airports Pay with Aeronca"

Name_____

Address_____

City and State_____

Export Agency—Aviaexpo, Inc., 25 Beaver Street, New York, N. Y.

New Equipment

Dimpler for High Strength Alloys

A new dimpling tool for B-301, 75ST and other high-strength, heat-treated aluminum alloys has been developed by Wilson Hubbell, chief of the laboratory metallurgical sec-

tion, and Terry Kell, assistant foreman in the sheet metal department of Ryan Aeronautical Co., San Diego 1, Calif., working in collaboration with Douglas Jones, head of the patent department. The new tool fits the standard dimpling machine, and in tests has produced strong, well-formed dimples in high strength alloys of all thicknesses up to and including .081 in. Experiments with greater thicknesses have not been completed. Unlike some other tools developed for dimpling high strength alloys, the procedure with the new Ryan tool is said to be simple, inexpensive, rapid and easily taught to the operator. The new tool will be made available to the industry through the Ryan sales department.

Electro-Starter for B-29

An electro-starter for starting and testing B-29 engines has been developed by Kurz & Root Co., Appleton, Wisc. It is a three-wheeled rubber-tired unit weighing about 1,200 lbs. with a 440-volt, 3-phase, 60-cycle AC motor, and a generator output capacity of 24-28 volts, 400-600 amperes, DC.

Surf-Chek Roughness Standards

A kit for determining finish designations is being offered by Surface Checking Gage Co., Hollywood 28, Calif., under the name of Surf-Chek Roughness Standards. It contains a 65-page text bound to a gage consisting of 20 replicas of machined surfaces prepared by turning, grinding, milling, honing, lapping and polishing, which vary in roughness from 5 to 500 micro-inches.

New Fractional HP Motor

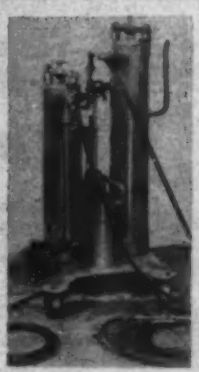
A new fractional horsepower motor designated as the EM-4 and designed to provide maximum power per ounce of weight and per inch of space has been announced by Small Motors, Inc., 1308 Elston Ave., Chicago 22, Ill. It is available in ratings of 1/30 to 1/10 hp and with ventilated or completely enclosed housing. Weight ranges from 3-4 lbs, depending on the rating. It is for universal AC-DC operation and can be wound for any voltage from six to 250.

400-Cycle Ignition Transformers

Three new 115-volt, 400-cycle ignition transformers, designed to provide a high-voltage arc for igniting fuel in gasoline-fired aircraft cabin heaters and de-icers, have been announced by General Electric Co., Schenectady 5, N. Y. The units are shielded and filtered to minimize radio interference over all wave bands from 110 kc to 200 mc. Two are of the single-secondary type and have an output of 6,000 volts each, while the third has a double-secondary and is rated at 6,000/6,000 volts. The units are housed in plated-steel cases and all coils are imbedded in a specially-developed high-melting-point, moisture-resistant insulating compound.

Aircraft Engine Preparer

An aircraft engine preparer known as the model PA 787 has been developed by Airplane Manufacturing & Supply Division, Pacific Airmotive Corp., 6853 Lankershim Blvd., N. Hollywood, Calif. It is designed to prepare engines for storage by introducing a fine spray of oil into the inside of a completely assembled engine. The caster-mounted portable unit includes an electric immersion heater for heating the oil and silica-gel in a separate pressure tank through which the air is filtered. A working pressure of 30 lbs. of air is required by the device.



Turco Air Filter Cleaner

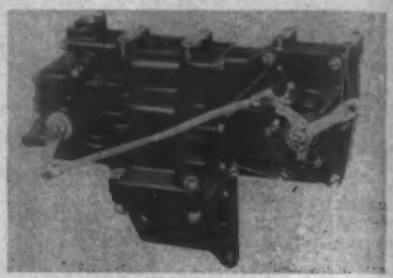
Turco Products, Inc., 6135 South Central Ave., Los Angeles 1, Calif., has announced a new process for the chemical cleaning of all types of air filters, in which the filter is removed and immersed for only six minutes in a tank of cold Turco Aktiv. It is then removed from the tank, given a cold water hosing to flush away dirt and grease, dried in a stream of compressed air, and dipped into the manufacturer's specified oil. According to time studies, the entire process takes under 13 minutes.

Hydraulic Wiper Ring

Wyse Laboratories, 211 South Ludlow St., Dayton 2, Ohio, has perfected a new AN-6231 wiper ring for hydraulic cylinders. The ring is slotted about its periphery for added flexibility and to assure precise conformation to the diameter of the piston rod. Scraping tension is derived from a perfect-fitting garter spring which breaks loose ice and scrapes away mud, sand and other foreign matter. There are two types available—a standard Army-Navy model, which is obtainable in 54 sizes, and an extra flexible, high-tension model, which has about half the weight of the Army-Navy model.

Automatic Boost Control

An automatic boost control for application to various single stage-single speed and single stage-two speed supercharged aircraft engines which is designed to protect the



engine from detonation or overstress and to reduce pilot fatigue has been announced by Eclipse-Pioneer Division, Bendix Aviation Corp., Teterboro, N. J. Due to military restrictions, design and engineering data are available only to government approved manufacturers.

Parallel Generator Operation

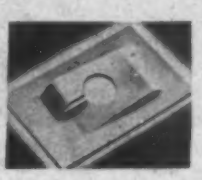
A new arrangement for the parallel operation of 400 cycle ac aircraft generators has been developed by engineers of the General Electric Co. and successfully demonstrated under conditions simulating combat emergencies at the G-E Schenectady Works. Engineers responsible for the arrangement say it will prevent any portion of a plane's remotely controlled gun turrets from being knocked out of action due to loss of an engine, and will in effect permit the plane's generators to come to the rescue of one another instantaneously and automatically. Parallel operation required the development of a new high-speed governor capable of holding frequency and dividing the power load equally among engines operating at different speeds.

Boring Tool and Tool Holder

A new precision tool holder for use with its circular boring and turning tool has been developed by The Shearcut Tool Co., Tenth & Harris Sts., South Bellingham, Wash. It is made in five sizes to accommodate lathes and screw machines from 10-36 inch swing. Each tool holder is furnished with three boring bars, one of which is arranged for turning in the smaller sizes.

Self-Locking Fastener

Stalock is a new type self-locking sheet metal fastener developed by Adel Precision Products Corp., Burbank, Calif. It is a one piece, resilient, spring steel stamping and grips screw threads all around with full 360 degree engagement. According to the manufacturer, it has been awarded an AAF rating, and has also been approved for listing by the Civil Aeronautics Administration.



A NATURAL PEACETIME STEP— TO AN ALL-METAL SILVAIRE FROM AN ALL-METAL FIGHTER!

GRUMMAN HELLCAT, U.S. NAVY

When wartime pilots return to peacetime pursuits, they'll naturally choose for their personal use, an all-metal plane. For aerial warfare has proved this: all-metal plane construction ensures greater durability, added air speed, extra economy of operation.

Luscombe's whole history has been one of utilizing metal in aircraft. Luscombe pioneered with an all-metal light plane—the SILVAIRE. And since war was declared, Luscombe has played an important part in the fabrication of metal parts for many famous fighter planes including the "Hellcat." You may be sure the vast experience gained from years of all-out war production will result in Luscombe's offering a new, notably improved all-metal SILVAIRE—a postwar personal plane destined for a great future.

JML Co. LE-3

LUSCOMBE AIRPLANE CORPORATION, Dept. E-2
Trenton 7, New Jersey
☐ Please tell me more about the SILVAIRE.
☐ I'm interested in a Luscombe SILVAIRE dealership.

NAME_____

STREET_____

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LUSCOMBE AIRPLANE CORPORATION • TRENTON 7, NEW JERSEY • DALLAS, TEXAS

4 West Coast Companies Open Joint Wind Tunnel

By Peggy Hereford

A NEW HORIZON for development of future aircraft—planes of super-sonic speeds and radical improvements—loomed into view with the opening of Southern California's Cooperative Wind Tunnel May 13 in Pasadena. The $2,500,000 project is owned jointly by Consolidated Vultee, Douglas, Lockheed, and North American aircraft companies, and is operated by the California Institute of Technology.

Millikan

Started in 1941, the tunnel is duplicated in the East in one of similar design being built for Curtiss-Wright Corp. at Buffalo, N. Y. Both tunnels were designed by Cal Tech engineers, and are constructed to fit these special requirements:

1. Size had to be such as to make the construction of complete airplane models relatively simple.

2. Operating conditions had to cover speeds up to the velocity of sound and also scales, or Reynolds Numbers, as large as possible.

3. Accuracy had to be extremely high, and the time required to make the tests and obtain complete data had to be held to the absolute minimum.

4. Wide flexibility in the type of test which could be conducted, and the transition from tests on one project to those on another had to be rapidly and easily achieved.

To meet these requirements, many new features are incorporated. A working sphere having cross-sectional dimensions of 8½ ft. by 12 ft. can accommodate models of 10 ft. span. The diameter of the tunnel is 31½ ft., narrowing rapidly to the dimensions of the working section.

Into the tunnel, constructed by Consolidated Steel Corp. of Los Angeles, went two and a half million pounds of steel and 17 miles of electric-arc welding to insure an air-tight, welded steel unit capable of withstanding pressures which vary between ¼ and 4 atmospheres.

Walls are made from steel plate almost one inch thick. The shell in the vicinity of the fan blades is reinforced to withstand a radial force of one million pounds, while at the corners of the tunnel are many mammoth steel vanes which bend the air at right angles to itself.

With 12,000 hp available to produce the airflow, velocities beyond 700 mph can be attained with the tunnel evacuated and scales equivalent to that of a 40 to 45 ft. span model reached with the tunnel at high pressure. Uniform and non-fluctuating flow of air over the model is gained by forcing the air through a rapid contraction just upstream of the working-section, or where the tunnel diameter of 31½ ft. narrows rapidly to the 8½ by 12 ft. throat at the working section.

The working section itself is closed off by a massive 18 ft. diameter steel door and two gate valves which cut across the airflow circuit ahead and downstream of the sphere.

Hydraulic operation permits the sphere to be hermetically sealed. Thus when the tunnel is operated under either pressure or vacuum conditions, and model adjustments or modifications are to be made, the sphere may be isolated from the tunnel, brought to atmospheric pressure, and entered by operating personnel without loss of pressure or vacuum in the remaining 90 per cent of the steel duct.

More than 500,000 propellers bearing the Hamilton Standard emblem have been delivered to the armed services. They comprise over three-quarters of all propellers on American warplanes. In addition, two-thirds of all propellers on British-built warplanes are of Hamilton Standard design.

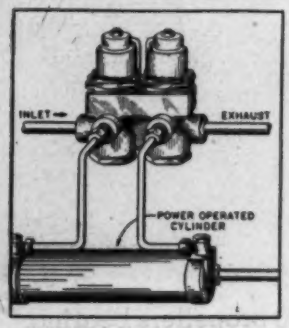
HAMILTON STANDARD PROPELLERS
EAST HARTFORD, CONNECTICUT
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

GENERAL CONTROLS

AV-Series Valves

— offer four outstanding advantages that make them the choice of the aircraft industry.

1. **Fastest known valve operators—**
   Some models open and close hundreds of times a second.
2. **Will stand vibration—**
   Extreme resistance to vibratory motion and acceleration.
3. **Multipoised—**
   Will operate in any position.
4. **Longer life—**
   Exclusive design and structural features provide infinitely longer life.



AV-8 *This valve, on current failure, will cause piston to go to one end; on application of current, to travel to opposite end and remain as long as current is applied. To position the piston, a PV-7 type valve is offered. Fluid connections, I.P.S., tube or flanged.*

General Controls AV-Series Valves are a distinct departure from all previous electric valves known to industry. They are especially designed and built for use in the aircraft industry.

The AV-Series includes accurate, dependable control valves for oil, air, water, gas, steam, fluid greases, gasoline, gasoline vapor or vapor mixes, sulphur dioxide, freon, methyl chloride, brine, alcohol and anti-icing fluids.

If you have an automatic control problem, write nearest General Control Factory Branch or Distributor today, or

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FACTORY BRANCHES: PHILADELPHIA • ATLANTA BOSTON • CHICAGO • KANSAS CITY • NEW YORK DALLAS • DENVER • DETROIT • CLEVELAND HOUSTON • SAN FRANCISCO • SEATTLE • PITTSBURGH DISTRIBUTORS IN PRINCIPAL CITIES

which contains some 225,000 cu. ft. of air.

A complex system of valves, hydraulic jacks and controls allow such operations to be accomplished in very few minutes and the tunnel is quickly in operation upon completion of model changes by closing the sphere door and opening the gates.

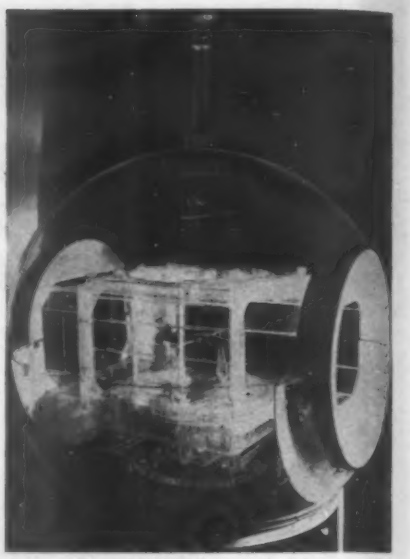
A further speed-up and unique feature of the tunnel is found in the three interchangeable working sections as provided by three huge steel tables or carts which carry models in and out of the actual working sphere on steel rails. Thus all preliminary work on a model can be done in two outside working areas while a third model is undergoing actual tests.

Each table has a different type of support with three methods of model support provided—ring supporting system, three-point system, and NACA strut support system.

By making adjustments and setting up for tests outside of the actual sphere, hours and even days of tunnel time are saved in proving a new model. Once inside the sphere, the steel cart is lowered into place by mechanical arrangements. The model supports float on oil "pads," and their motion is restrained by devices which are sensitive to any changes in pressure exerted against the model by the air stream.

Recording devices on the model are connected before the table is wheeled into the tunnel. Only remaining adjustment within the sphere is attaching multiple plugs which connect directly to the indicators and gauges in the control room.

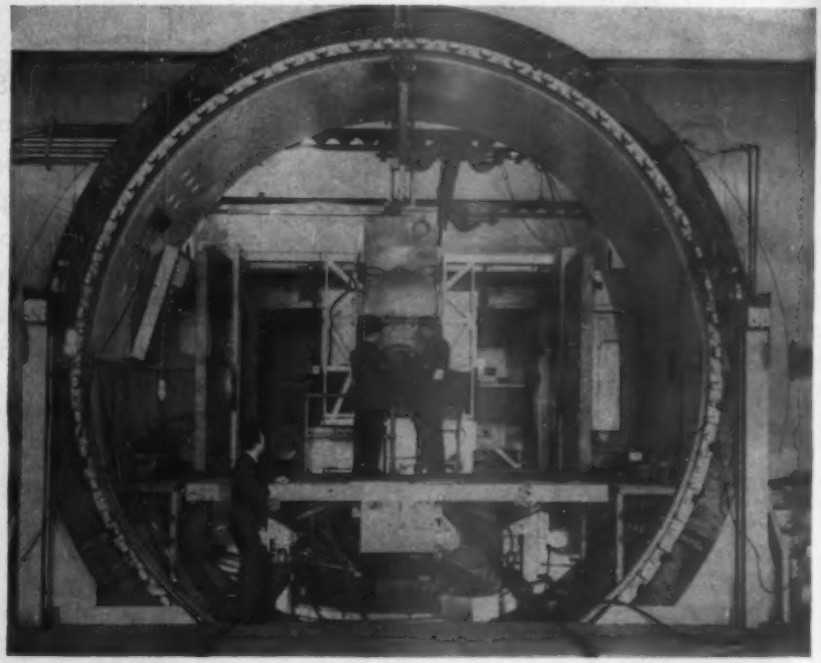
Another "first" for the tunnel is the specially designed International Business Machine measuring and recording equipment which translates the metrical system dial readings of model reactions into electrical impulses. Under the IBM setup, all pertinent test data are visually



This scale model of the working section of the wind tunnel was built of clear plastic before construction on the project was started.

exhibited on light bank display panels and simultaneously recorded on printed tapes and punched cards. The data on the punched cards are reduced to final form by additional IBM machine operations, thus reducing calculation time and chance of human error.

Thomas J. Watson, president of IBM, donated the new precision recording device to Cal Tech, which in turn incorporated the installation into the tunnel. J. W. Bryce, IBM senior scientist, A. H. Dickinson, senior engineer, with R. I. Roth and J. N. Wheeler, assistant engi-



View of the working section in the decompression sphere.

Looking toward the post-war years . . . when expanding civilian air traffic will make adequate crash fire protection a "must" . . . Detroit City Airport has met the challenge with this big-capacity, fast-acting Cardox Airport Fire Truck.

This truck . . . the first of its kind to be made available to a civilian airport . . . is a highly specialized fire-fighting unit, based upon experience gained in producing hundreds of Cardox Airport Fire Trucks for military bases in the United States and abroad.

Self-contained . . . highly mobile . . . geared for easy maneuverability . . . it packs the terrific wallop needed to knock out crash fires fast and make possible speedy rescue of plane personnel. *Two tons* of liquid CO_2 can be released onto the fire zone in approximately one minute, if necessary. Backing up this big supply of zero-cold, fast-acting carbon dioxide is 220 gallons of foam solution . . . which blankets exposed gasoline and hot metal surfaces during and after extinguishment to prevent possible reignition.

Overwhelms Vicious Crash Fires With Amazing Speed

Cardox Airport Fire Trucks are the only mobile units which combine the two fast, efficient extinguishing mediums in these large quantities to conquer the vicious fires that can result when a big plane crashes. Crash fires involving heavy bombers, frequently carrying thousands of gallons of aviation gasoline, have been literally overwhelmed by this "mass attack" . . . permitting rescue of personnel in *seconds* after the Cardox Truck reached the scene of the crash.

Pictures shown above were taken during demonstration held at the Detroit City Airport. Small picture at left shows fire at its height. Center picture shows the beginning of the attack by the Cardox Truck, discharging CO_2 at the rate of approximately 4000 pounds a minute. Picture at right—*made 30 seconds after extinguishment was begun*—shows all fire extinguished.

New Bulletin Gives Full Facts

Airport authorities facing the problem of adequate fire protection for present and post-war operations should get full details on design, operation and performance records of Cardox Airport Fire Trucks. Write today for Bulletin No. 2755.

CARDOX CORPORATION
BELL BUILDING • CHICAGO 1, ILLINOIS
District Offices In New York • Washington
Detroit • Cleveland • Atlanta • Pittsburgh
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CARDOX
CO_2 FIRE EXTINGUISHING SYSTEMS

neers, carried out design and development of the specialized project.

Fans of the tunnel are designed to circulate the air and to absorb the full 12,000 hp available at a given rpm over a range of air densities of 16 to 1. To accomplish this, there is a dual or tandem fan installation, each fan having 16 controllable pitch blades. The downstream fan can be uncoupled and stopped with its blades feathered for high pressure operation when the air is dense and relatively few working blades are required.

Ahead of each fan are adjustable prerotation vanes which permit the swirl of air to be controlled by the tunnel operator. All adjustments are coupled together so that a single set of push-buttons in the master control room permits the entire system to be operated at maximum efficiency.

The two fans are mounted on a single propeller shaft. Power is furnished by a combination of electric motors consisting of 2000 hp direct current motor, supplied by a motor-generator set, together with a 10,000 hp alternating current induction motor with liquid rheostat control, both mounted on the propeller shaft.

As the fans drive the air around and around the duct, a cooling system holds the air at regulated temperature. Coils are installed just ahead of the working sphere. The air's humidity is controlled by a dehumidifying system.

Still another feature, to be installed later, (installations will continue for many months to come) is a television unit to enable the operating engineers to observe the model in the airstream. An image will be projected on a screen and the image in turn reproduced on a screen in the control room where operators will "watch" the model.

Dr. Clark B. Millikan, director of the tunnel, who is professor of aeronautical engineering at Cal Tech, points out that the project is designed for use in development, construction and modification of aircraft, that it is not emphasizing pure research studies.

Under his direction, Cal Tech has a management contract for a five-year period. Participating companies will share in use of the tunnel according to the company's share in the tunnel's cost. Outside companies will probably be able to use the tunnel. Charges for such usage have not been set, as exact details for non-participants have yet to be worked out.

The 10-foot low speed wind tunnel given Cal Tech 10 years ago by the Guggenheim Foundation is still in use and will continue to serve the institute for its own studies as well as companies desiring to carry out experiments.

Facts and Figures

Cost	$2,500,000, of which Consolidated Vultee Aircraft Corp. and Douglas Aircraft Co. Inc., contributed one-third each and Lockheed Aircraft Corporation and North American Aviation, Inc., contributed one-sixth each.
Tunnel Size over-all	179 ft. over-all length and 72½ ft. maximum width.
Working Section	12 ft. wide by 8½ ft. high.
Maximum Diameter	31½ ft. diameter.
Contraction Ratio	8 to 1.
Maximum Pressure	4 atmospheres or { 44.1 sq. in. gauge pressure. / 58.8 sq. in. absolute pressure.
Vacuum	¼ atmosphere— { 22 in. mercury or / 3.6 sq. in. absolute pressure.
Size of Fan	21 ft. 9½ in. diameter.
Number of fans	2.
Number of blades in each fan	16.
Fan Hub Diameter	12 ft.
Size of Nacelle for Fan Hub and Bearing	12 ft. diameter by 50 ft. long.
Drive Shaft	16 in. O.D. hollow steel; ½ in. wall
Main Drive Power	12,000 hp maximum.
Main Drive Speed	595 rpm maximum.
Air Speed	More than 700 mph.
Model Power Supply	400 hp over range of 150 to 450 cycles. Voltage available—up to 600 volts.
Weighting System Capacity—Maximum	Lift +30,000 lbs. to —15,000 lbs.
"	Drag +5,000 lbs. to —2,500 lbs.
"	Cross-wind force +5,000 lbs. to —5,000 lbs.
"	Pitching moment +10,000 ft. lbs. to —10,000 ft. lbs.
"	Yawing moment +10,000 ft. lbs. to —10,000 ft. lbs.
"	Rolling moment +10,000 ft. lbs. to —10,000 ft. lbs.

New Aircraft Engine Ignition System Developed by Mallory Concern

A NEW aircraft engine ignition system developed by P. R. Mallory & Co., Indianapolis, incorporates high frequency at the spark plug electrodes and low voltage generation and distribution to the spark plugs. The result of a development program started in 1939, it underwent a 155-hour ground test at Wright Field in August, 1944, and was successfully flight tested by the Army Air Forces at Vandalia, O., on Oct. 10, 1944. It is now undergoing further flight tests on four B-24 Liberators at the Smyrna Army Air Base, Smyrna, Tenn.

Among the many advantages claimed for the Mallory system, the two most important are that it will fire spark plugs when fouled or extremely dirty, and that it will operate successfully at altitudes up to 50,000 feet. Other claims are that it will permit the immediate opening of the throttle after long periods of idling, taxiing or gliding with the assurance of full power delivery; allow the use of colder spark plugs, thereby permitting increased engine output; increase spark plug life and reduce gap erosion; reduce radio interference; and make possible weight savings of up to 10 lbs. per engine over conventional ignition systems through changes in magneto design.

With the Mallory system, low voltage (approximately 1,200 v) is generated at the magneto and distributed through shielded leads to the spark plug. At the manifold ring, the low frequency energy of the magneto is converted to high frequency or radio frequency (2,000,000-3,000,000 cps) energy by an impulse type frequency converter. At the spark plug, this low tension, high frequency energy is stepped up to a voltage (approximately 10,000) sufficient to jump the spark plug electrodes by means of a small transformer hermetically sealed in the well of a standard aircraft spark plug.

At present all developmental work on the Mallory system is being directed towards its employment in large, high altitude planes, but because of its advantages in firing fouled spark plugs and extending plug life, there is a decided possibility that lightplane applications will be worked out after the war. Licenses and manufacturing rights for the new system will be granted to reputable established manufacturers in the aircraft and automotive ignition field wherever such action will benefit the war effort, the company states.

High Frequency Ignition— This is the heart of the new Mallory high frequency ignition system. It consists of a spark plug transformer, a shielded detachable lead, and a frequency converter. A special transformer, hermetically sealed in the barrel of a standard aircraft spark plug, is not shown.

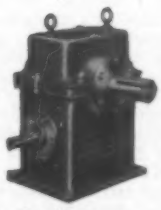
Giles Succeeds Harmon

Lt. Gen. Barney M. Giles, deputy commander of the AAF and chief of the Air Staff, has been named commanding general of the AAF in the Pacific ocean areas, the War Department announces. He succeeds Lt. Gen. Millard F. Harmon, who has been reported missing. Gen. Giles will be succeeded in his Air Force posts in Washington by Lt. Gen. Ira G. Eaker, who has commanded the Mediterranean allied air force since December, 1943. Lt. Gen. John K. Cannon, who has been commanding general of the 12th Air Force, will succeed Eaker.

MASTERING POWER

"A-Q" (aircraft quality) Gears

Industrial Gears



Speed Reducers

Back in 1859 when Foote Bros. was founded, America was on the threshold of a mighty industrial development. At that time many foresighted planners looked to Foote Bros. for the solutions of their problems in mastering power.

As industry developed, the demand for increased speed, greater power and more efficient methods of transmitting that power grew. And Foote Bros. met these demands.

Looking forward to new horizons of power transmission, by 1940 Foote Bros. developed a revolutionary type of gear. This gear came closer to theoretical perfection than any before achieved. It took the exacting demands of laboratory technique and translated them into mass production.

Today these gears are being produced in the plants of Foote Bros. by the millions and are proving their value in the mighty aircraft engines that power so many of our fighting planes.

In the laboratory of Foote Bros. are other developments that promise better power transmission to industry after the war. Some of these are well on the road to mass production—others are little more than promising experiments.

For your production today—for the equipment you are planning to manufacture in the future—the advanced engineering in power transmission developed in the laboratories of Foote Bros. may offer solutions to the problems you face.

FOOTE BROS. GEAR AND MACHINE CORPORATION, Dept D, 5225 S. Western Blvd., Chicago 9, Ill.

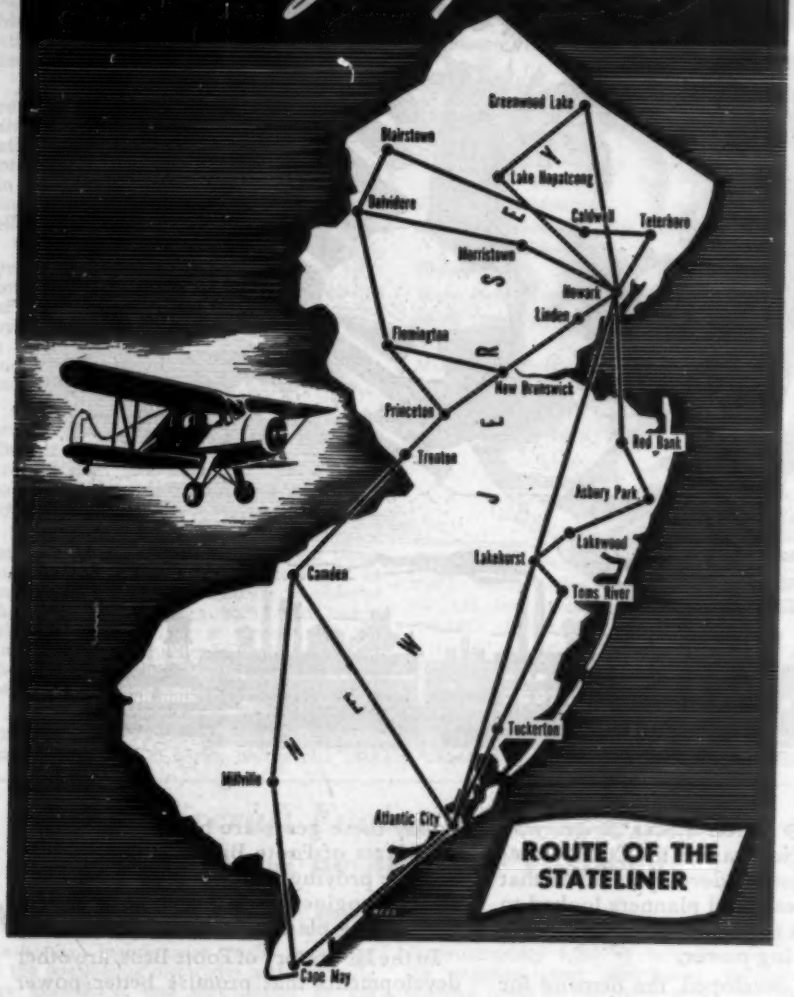
FOOTE BROS.

Better Power Transmission Through Better Gears

A copy of this informative product engineering manual on "A-Q" gears will be sent to you on request.

OTTO AIRLINES

"The New Jersey Network"



Offering complete coverage by air of New Jersey for the first time, Otto Airlines' proposed Stateliner route connects every city and town in this area with the major trunk lines. Already operating on a charter basis, Otto Airlines has piled up a background of more than 30,000 miles flown over this territory. An organization of experienced personnel and complete operating, overhaul and maintenance facilities awaits the inception of regular, scheduled flights over the New Jersey network.

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New Jersey's First Airline

Jacobs Aircraft Co. Sold to New Concern

Majority holdings in Jacobs Aircraft Co., Pottstown, Pa., have been sold to the newly formed Continental Engineering and Management Corp. of New York.

The name of the company will remain Jacobs Aircraft Co. No changes of policy, operating management or employes are contemplated. J. A. Harris, 3rd, chairman of the board of Jacobs, said the move was made to widen the financial and manufacturing scope of the engine company and pave the way for broader participation in postwar development.

Continental Engineering and Management Corp. has no connection with the Continental Aviation and Engineering Corp. or the Continental Motors Corp., both of Muskegon, Mich.

Included in the purchase arrangement was an agreement by the Continental firm to purchase within 30 days all or any part of the stock held by minority stockholders in the Jacobs company at $6 net per share. Sale of the 59 percent majority holdings was at a figure somewhat less than $6 per share, due to payment of commissions.

'Catapult Seat' Throws Pilot Free in Crashes

A "catapult seat" consisting of a sort of miniature elevator operated by an electric motor has been developed by Vultee Field Division engineers of the Consolidated Vultee Aircraft Corp. The principal purpose of the new seat is to throw the pilot of a pusher type airplane free of the plane in times of emergency so that he will not be injured by the propeller blades, but it can also be used to simplify entering and leaving the ship under normal conditions. In such cases, it is extended beneath the fuselage or cockpit nacelle, the pilot sits down and pulls a lever, and it lifts him smoothly into the cockpit. To leave the pilot simply readjusts the lever and lowers himself to the ground after landing. On the other hand, in time of emergency, he can pull an auxiliary lever, and the seat will not only lower him while still in the air, but in addition catapult him clear of the plane and prop blades.

The seat was designed by Frank W. Davis, Convair test pilot, for use in the XP-54 experimental pusher-type fighter.

Loening Goes to NACA

At the end of this month, Grover Loening will transfer from the War Production Board to the National Advisory Committee for Aeronautics, where he will act as Consultant on Aircraft for an indefinite period. Loening's assignment with the War Production Board covered a period of three years beginning in May, 1942. His duties as confidential consultant for the Chairman of the War Production Board continued all through that period, but he was also frequently assigned to other departments of the government in an expert advisory capacity, including his last tour of duty, now completed, as Special Assistant to the Secretary of the Navy for Air, A. L. Gates.

Distinguished for Long Service

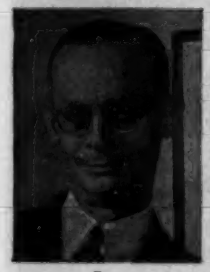
The Edo-equipped Vought-Sikorsky OS2U Kingfisher . . . veteran of countless spotting and rescue missions since Pearl Harbor . . . is still the indispensable "mercy ship of the air" in every theatre of over-ocean operation.

EDO FLOAT GEAR

EDO AIRCRAFT CORPORATION, COLLEGE POINT, L. I., NEW YORK

Present Specifications For Jet Fuel Tough To Meet, Says Oil Expert

Present specifications for jet propulsion fuel are very rigid and in some respects are tougher to meet than the specifications for 100 octane gasoline, according to David E. Day, acting head of manufacturing of Richfield Oil Corp., first petroleum company to produce jet propulsion fuel commercially.



Day

The basic problem, he said, is that JP fuels must have the maximum possible heat units per pound, so that a minimum weight of fuel will propel the plane a maximum distance. This rules out quite a list of hydrocarbons, particularly those of a low hydrogen to carbon ratio. More hydrocarbons are eliminated by the fact that the fuels must have a very low freezing point to permit extremely high altitude and correspondingly low temperature operation. Others are barred by clean burning requirements and the importance of not leaving deposits on the finely balanced rotating parts of the engine, and still others by the need for a high ignition temperature.

Actually, Day stated, they can make more gallons of 100 octane from a barrel of crude than they can JP fuel. To produce JP fuel, it is necessary to segregate a particular type of crude oil, fractionate out a specific, close cut from this crude, and then develop the correct type of chemical treatment for this close cut fraction.

A further problem arises from the fact that each particular fuel is suitable for just one type of jet propulsion unit—one proving superior for axial flow engines, another for the intermittent explosion type, and still another for the engines which depend on high speed and the ram effect of the air instead of a compressor.

In addition to giving new latitude to designers of gas turbines and jet propulsion engines, the petroleum industry has new fuels for postwar reciprocating engines, Day added, pointing out that Richfield's Watson refinery can now produce a fuel with a 150 octane rating the full power of which cannot be utilized in present day engines.

Winterization Problems Few in Airacomet Tests

Winterization problems normally associated with conventional aircraft were not encountered during recent tests of the jet propelled Bell P-59 Airacomet, according to Arthur L. Fornoff, director of service for Bell Aircraft Corp. He predicted that the use of jet propelled planes will eliminate many of the difficulties now experienced by military and commercial aircraft in cold weather operation. Among other things, he pointed out, the G-E turbo jet engine uses such thin oil normally that the usual problems of heating and diluting oil for reciprocating engines were not even a consideration.

Alaska tests of the P-59, he said, confirmed that the increased oxygen from the cold air, which is greatly densified at lower temperatures, increased the thrust from the jet engines, making for shorter, faster take-offs and increased speed at lower altitudes.

April Production Above Schedule

Aircraft production in April totalled 6,412 planes, one percent above the working schedule of 6,359. While the number of planes was nine percent less than in March, the April airframe weight (excluding spares) of 73,600,000,000 pounds declined only seven percent from the 70,200,000,000 pounds in March.

J. A. Krug, chairman of the Aircraft Production Board, praised the industry for its even flow of output during the month, which permits an orderly progression of planes to the fighting fronts. An average of 256 craft was produced per working day compared to the schedule of 254.

The breakdown of April production by primary classes is:

	Acceptances	Schedule	Ahead or Behind Schedule
Bombers	2270	2221	+2 %
Fighters and Naval Reconnaissance	3019	3004	+ .5%
Transports	591	599	—1 %
Trainers	168	168	.....
Special Purpose	364	367	—1 %

WPB Chief of Operations Hiland Batcheller has revealed that March aircraft production was valued at $1,313,000,000, which was $3,000,000 or two percent below schedule. Critical aircraft gained 21 percent instead of the scheduled 28 per cent.

Direct Hit—Although one of its hollow steel propeller blades tried to stop a 40 mm. cannon shell, this P-47 Thunderbolt returned to its base. The blade was manufactured at the Curtiss-Wright Propeller Division plant at Caldwell, N. J.

Need For Child-Care Being Emphasized By Plants on West Coast

West Coast aircraft plants, employing 42% womanpower, are placing increased emphasis on the need for child-care in order that the percentage of women employes may be stepped up. Primary requirements of the child-care program are suitable buildings and playgrounds, and funds to operate and maintain such centers.

Further development of the program is blocked at present by lack of funds to construct additional centers, although Congress voted $20,000,000 to the Federal Works Agency in the first deficiency appropriation of 1945. Most of this money will be needed, it is said, to maintain and operate existing services.

A survey shows that in Los Angeles alone, 30 nursery building units and 75 to 100 classrooms for extended day care could be utilized fully if made available. Demand is increasing steadily for all types of care, particularly for group-care facilities for infants under two years of age. As induction of young fathers into military service increases, and mothers of small children must seek employment, this need becomes greater, the survey shows.

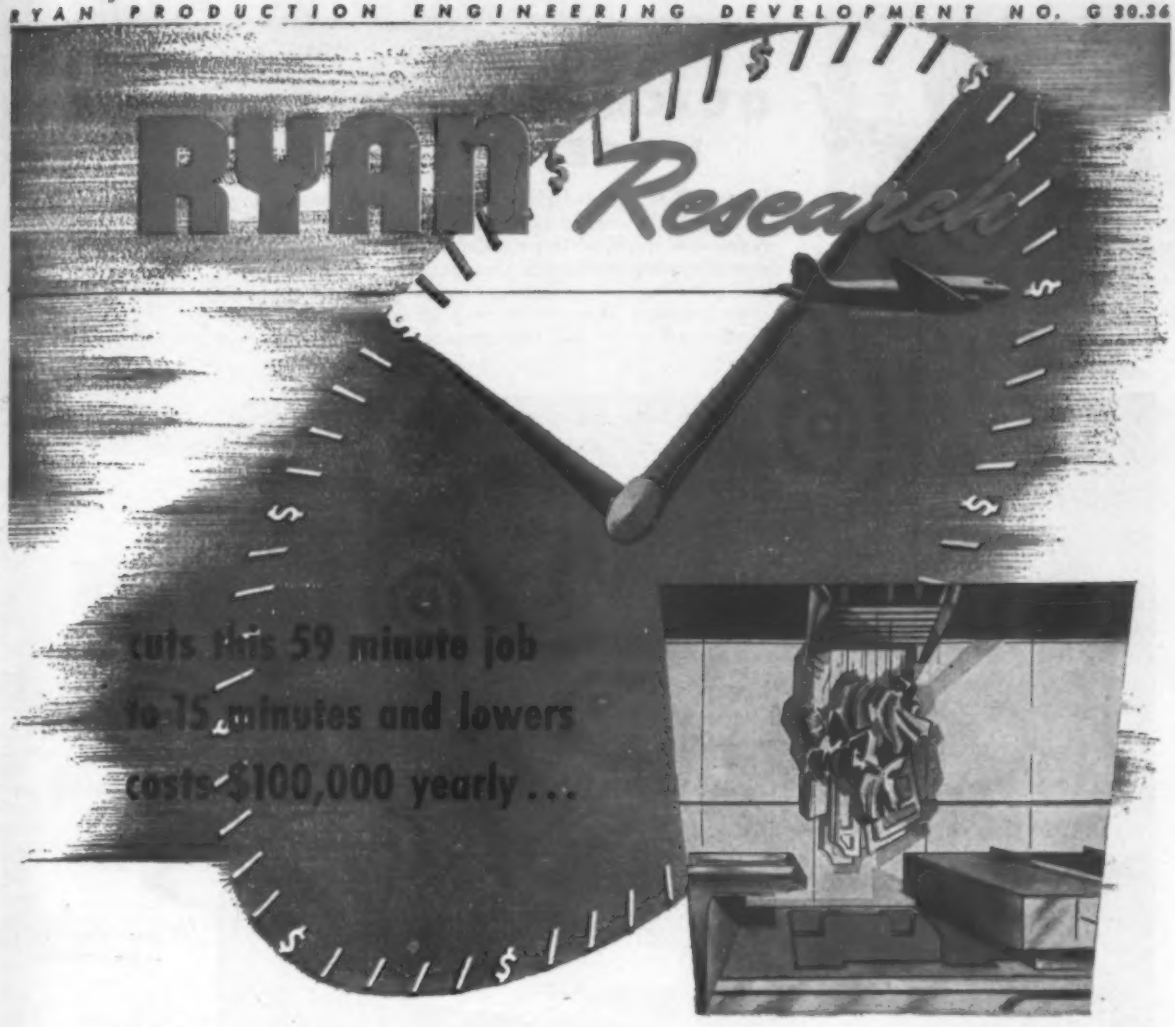
Opposition to Subsidies Voiced by Donald Douglas

Donald W. Douglas, president of Douglas Aircraft Co., and chairman of the Board of Governors of the Aeronautical Chamber of Commerce, said in a Washington press conference that aircraft industry leaders are opposed to a subsidy to maintain their operations after the war, and that what is needed is a clear definition by Congress and the Administration of postwar aviation policies.

Before the industry can go ahead with its postwar plans, it must have the answer to the questions that will determine what facilities it will have for postwar production and when those facilities will be available. The answers involve finding a solution to such basic national problems as: (1) What shall be the strength and structure of our peacetime air forces; (2) what steps will be taken by the government to insure a continuation of present technical development in aircraft; (3) what do Congress and the armed services plan to do to insure America a strong aircraft industry; (4) what facilities will the government require as a stand-by reserve?

Douglas said that surplus aircraft disposal is another problem to be dealt with, and that prompt authorization for the production of experimental models of transport and personnel aircraft is essential if production of civilian craft is to go ahead after V-E Day.

RYAN PRODUCTION ENGINEERING DEVELOPMENT NO. G 30.36



. . . Another Ryan Step Toward Better Airplanes at Lower Cost

THE PROBLEM: In welded stainless steel parts, the conventional method for relieving the internal stresses and removing the welding flux, involves:

Step 1 – 15 Minutes defluxing in acid tank
Step 2 – 2 Minutes sandblasting per part
Step 3 – 12 Minutes stress-relieving in air furnace
Step 4 – 30 Minutes pickling in acid bath
TOTAL – 59 Minutes

THE SOLUTION: A sodium carbonate salt bath, developed in the Ryan laboratory, revolutionizes the entire stress-relieving and defluxing process as follows:

Step 1 – 5 Minutes stress-relieving in salt bath
Step 2 – 10 Minutes cold pickling
TOTAL – 15 Minutes

THE ADVANTAGES: By eliminating two operations and cutting the required time to one-fourth, this new Ryan process not only saves wartime tax payers $100,000 yearly, but is speeding up production of fighting craft urgently needed in the Pacific war theatre.

THE CONVENTIONAL method for relieving the internal stresses caused by welding certain vital stainless steel aircraft parts, has for years involved a heat treatment requiring *four* operations and fifty-nine minutes.

Approaching the problem from a fresh angle, Ryan laboratory technicians have evolved a completely new sodium carbonate salt bath procedure for stress-relieving and defluxing such parts. Maintaining the same high quality, the new Ryan process is completed in two operations requiring a total of only fifteen minutes.

Today . . . the analytical skills of Ryan laboratory technicians and the ability of Ryan designers and engineers are devoted to the creation of combatant aircraft. Tomorrow . . . Ryan will again devote itself, with the same directness for efficiency and economy, to solving problems of peacetime aviation.

RELY ON RYAN TO BUILD WELL

1922 1945

RYAN Airplanes

Ryan Aeronautical Company, San Diego — Member, Aircraft War Production Council, Inc.

DESIGNERS AND BUILDERS OF NAVY FIGHTING PLANES AND EXHAUST MANIFOLD SYSTEMS

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Because Weatherhead quick-attachable (Q-A) hose fittings can be easily installed as either original equipment or replacement work, service-men and mechanics have stated overwhelming preference for them. They are available in two types for low pressure or for medium and medium-high pressure lines. Write or phone any Weatherhead branch office for our new Aviation Catalog. It's free!

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Manufacturing Personnel

Walsh

Storer

Myrick

Luscombe

Rayeroft Walsh, vice chairman of United Aircraft Corp., has been awarded a 15-year service pin. He joined the Hamilton Standard Propeller division in 1930 as vice president and a director.

Alan F. King, formerly with Consolidated Vultee Aircraft Corp. as assistant to the then vice president, Hugh McL. Fenwick, has joined Hughes Aircraft Co. as director of economic research. Fenwick is now general sales manager of Hughes.

E. Digges La Touche, at one time executive assistant to the director general of the British Air Commission, has been named by Briggs Clarifyer Co. to administer the field service engineering staff of its aviation division.

George Myrick has been named manager of personal aviation sales, and **Charles F. Luscombe** has been appointed sales engineer for personal plane radio by Bendix Radio Division of Bendix Aviation Corp.

M. E. Storer, formerly with Wright Aeronautical Corp. in charge of experimental engine test design, has joined Jacobson & Co., engine test equipment, as executive engineer.

Tom M. Girdler has resigned as chairman of the board and as a director of Consolidated Vultee Aircraft Corp. after almost three and one-half years of service. In accepting Girdler's resignation, the Consolidated Board expressed gratitude to the Republic Steel Board for permitting them to share his managerial talents. He served Consolidated without any increase in his personal income.

K. A. Day, formerly assistant superintendent of final assembly, has been made superintendent of B-32 modification at Consolidated Vultee's Fort Worth division. **R. F. McAuley** has been transferred to superintendent of final assembly, and **Hugh L. Winsett** has been elevated to superintendent of sub-assemblies.

Col. N. Jay Boots, formerly president of Boots Aircraft Nut Corp., has been elected chairman of the board, and **W. Chalmers Burns** elected president to succeed him.

John C. Harrower has been elected vice president of Air Associates, Inc., in charge of sales and engineering. He was previously sales manager for Eclipse Aviation division of Bendix Aviation Corp.

Frank Russell, president of Cerro de Pasco Copper Co., and **Charles S. Thomas,** president of Foreman & Clark, clothiers, have been elected directors of Lockheed Aircraft Corp.

Light Plane Makers Ready to Produce Safe, Easy-Handling, Economical Craft

DEVELOPMENT of postwar private flying was characterized at a recent Aeronautical Meeting of the Detroit Section, Society of Automotive Engineers, as a multiple enigma comprised of many variables which only time can reveal. The speakers reported that American manufacturers are equipped to produce safe, easy-handling, and economical personal planes.

John W. Friedlander, president of Aeronca Aircraft Corp., said that the primary function of the airplane, reduction of distance in terms of time, was admirably suited to serve postwar psychology. He suggested the possibility of operating personal planes at approximately five cents per mile, and declared that savings of time through travel by private plane will be so great that operating costs become relatively insignificant. He predicted that postwar private planes will make 1,000-mile trips easy, cheap, and commonplace.

Ray A. Robinson, Crowell-Collier Publishing Co., reported that while ownership of private planes by 38 percent of American families, as indicated by surveys, may not materialize, there is good reason to believe that within a few years after the war private planes will approximate 300,000 in number and their manufacture will be bigger business than catering to construction needs of commercial airlines.

The ease with which private planes may be safely operated was stressed as an important factor in the development of private flying by Raymond B. Maloy of the Civil Aeronautics Administration. He commented that controls and their use, as well as the feel of the plane, must follow a pattern with which an automobile driving public has become familiar.

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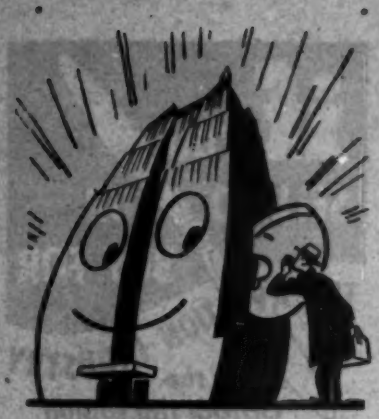

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P.S. Be sure to let us know, too, if you change your plans.

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CHARLES E. ROCHESTER, *Vice-Pres. and Mng. Dir.*
LEXINGTON AVENUE AT 48th ST., N. Y. C., 17

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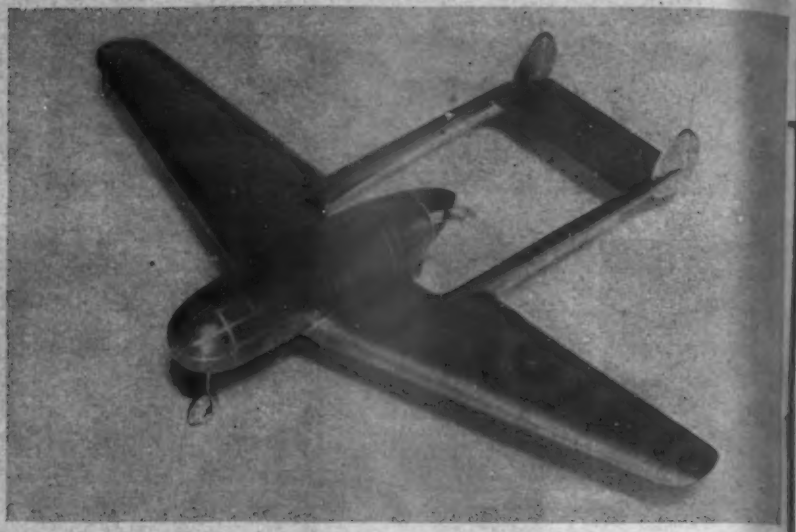

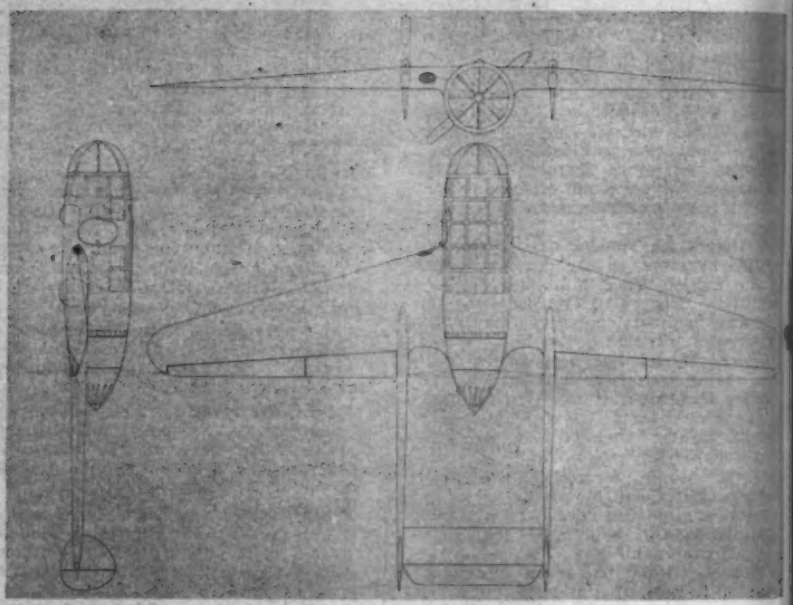

Family Explorer— This five-place version of the Explorer mapping plane is now being developed as a postwar family plane by Abrams Air Craft Corp. Lansing, Mich. A twin-boom pusher, it has tricycle landing gear. The cabin has been enlarged from that of the original Explorers, and cooling flaps, which would remain open for ground cooling but be closed in flight, have been installed just ahead of the engine. Air for cooling during flight will be brought in through tunnels in the leading edge of the wing. The refined design provides better stream-lining of the cabin, and will permit cabin pressurization. The proposed version will be powered with a 450 hp Wright R-975 engine.

'Air Education' Founded

The organization of Air Education, a non-profit foundation, to stimulate a comprehensive, coordinated program of education in the areonautical arts and sciences, is announced by A. J. Stoddard, superintendent of the Philadelphia public schools and chairman of the foundation's board of trustees. Application for a charter as a non-profit corporation has been made to the Board of Regents of the University of the State of New York, and after selection of personnel, operation of the foundation will begin about January 1, 1946 in a New York City headquarters to be announced at a later date.

Laird Enters Ad Field

Cody Laird has sold his interest in Southeastern Air Service, Atlanta, to Ben T. Smith, vice president, who now becomes president of the organization. Laird will continue as vice president of Southeastern Air Express, an affiliated company, and will actively prosecute its feeder line application before the CAB. He has also acquired an interest in Robert E. Martin & Co., advertising, and will devote a majority of his time to this interest, specializing in aviation accounts including that of Southeastern Air Service.

THERE'S A *New* FEATHER IN WACO'S CAP

Now rolling from the production line and winging its way off to war is the newest addition to the ranks of the "whisper" ships.

It's the CG-15A . . . a bright new feather in the cap of its designer and builder—WACO.

Similar in many respects to the WACO-designed CG-4A, this newest AAF glider incorporates several new features which are the outgrowth of the battle experience gained by the CG-4A in spearheading four major invasions. Wingspread has been shortened 20 feet to increase towing speed . . . a new nose section provides better vision and greater strength . . . passenger and cargo capacity has been increased . . . landing gear improved.

In the three military gliders previously designed by WACO for the AAF . . . and here again in the CG-15A, is evidence of the important contribution which WACO's long experience in plane design and construction is making toward Victory.

After Victory, when this same experience is again applied to peace-time plane production, the result will be something you'll want to see . . . something you'll want to own and fly. THE WACO AIRCRAFT COMPANY, 25 Peters Avenue, Troy, Ohio, U. S. A.

The CG-4A has a wingspread of 83' 8"; carries a two-man crew and 13 men; and has a useful load capacity of 3,427 pounds. The CG-15A (foreground, above) has a wingspread of only 62' 2½", but it carries 14 men, in addition to pilot and co-pilot, and can accommodate a useful load of 4,000 pounds.

Waco

ALL ARMY CARGO-TRANSPORT GLIDERS ARE WACO DESIGNED

On the Manufacturing Line

New Mariner More Powerful

A new and more powerful Mariner with 2,100 hp Pratt & Whitney R-2800-C engines has been in production for some time at The Glenn L. Martin Co., Baltimore, and already has seen combat in the Pacific. Known as the PBM-5, the new model has redesigned engine cowlings and airscoops to accommodate the new big engines, and internal design changes which in combination with the P&W powerplants give it a greater load capacity and longer range than the PBM-3. In a recent accelerated service test hop conducted by the Navy, a PBM-5 set a non-stop endurance mark of 28 hours, 6 minutes.

N-K Tries to Avoid Layoffs

Faced with a 20% cutback in propeller production as a result of the curtailed B-24 Liberator program at Willow Run, Nash-Kelvinator Corp. has increased schedules on other contracts to avoid laying off about 1,000 workers. Schedules increased include propellers for the Corsair, Hellcat, Lancaster and Mosquito among others.

Spotwelding Saves Many Manhours

Speaking before the Aeronautic Meeting of the Buffalo Section, Society of Automotive Engineers, H. A. Mullen and L. Beelter of the Ford-Willow Run plant reported that the application of spotwelding techniques to 100 assemblies used in making B-24 bombers had produced savings of 125 manhours per ship, a corresponding reduction in weight and a halving of original costs.

French Air Force Gets P-63's

P-63 Kingcobra fighter planes are being sent to the European theater for possible use by the French Air Force, the War Department reveals. The P-63's which have previously been used by Russia are leaving the Bell Aircraft Co. plant with French insignia.

G-E Has Navy Jet Contract

General Electric Co. has disclosed that it is now manufacturing jet engines for the Navy as well as the Army.

Increased Schedules for C-74

Douglas Aircraft Co. has announced revised schedules which sharply up the production rate of the C-74 transport and stabilize output of A-26 attack bombers at current levels at its Long Beach plant. The announcement marks the first time that the C-74 has been officially revealed as a military transport. Acceleration of C-74 output will help offset a 50% cutback in B-17 production.

Price of Black Widow $240,000

Price of the Northrop Black Widow P-61 night fighter has been set by the Treasury Department at $240,000, in contrast to a regular fighter at $75,000 and a heavy bomber at $250,000. Cost of the Black Widow is high because it is as large and powerful as a medium bomber, and in addition is equipped with radar and other expensive special equipment.

Willow Run on 40-Hour Week

The Ford Motor Co. is operating its Willow Run bomber plant on a 40-hour work week basis, despite War Labor Board orders to maintain a 48-hour schedule. The plant is scheduled to cease production of B-24 Liberator bombers by August. It has been operating two shifts of nine hours a day, five days a week.

P-51 Production to be Cut

Production of the P-51 Mustang will be cut in half within two months after VE-Day at North American Aviation's Dallas plant. Although full production will continue on the C-82 Packet, the company will not be able to absorb all workers dismissed by Mustang curtailments. Production of the Mustang is scheduled to continue at the reduced rate until June, 1946, but production of the AT-6 will be tapered gradually, ending in December, 1945.

B-H

Manufacturers of Sheet Metal and Tubular Accessories for Leading Engine and Propeller Manufacturers

B-H AIRCRAFT CO., Inc.
27-01 Bridge Plaza, N., Long Island City, N. Y.

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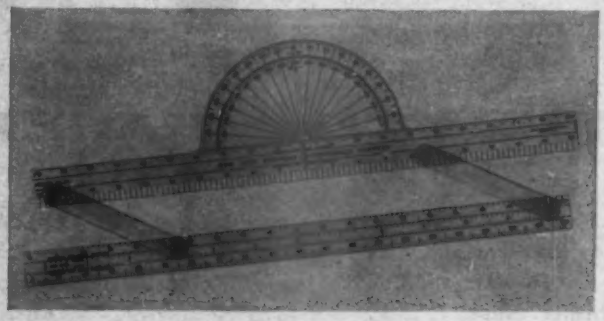

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Radio Communications Assemblies

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Remote Receiver Bay, using single frequency crystal-controlled receivers.

F3 RECEIVER... designed for telephone reception only, is compact, rack-mounting unit, having medium selectivity, high sensitivity, and flat automatic volume control.

Since 1931, Wilcox has manufactured dependable radio communications equipment to meet the particular needs of various types of installations. In fulfilling war requirements, many new developments have been perfected, which will be reflected in peacetime production. Today, Wilcox radio communications equipment for civilian needs is becoming available — subject to priorities.

WILCOX ELECTRIC COMPANY, INC.

Manufacturers of Radio Equipment

FOURTEENTH AND CHESTNUT — KANSAS CITY, MISSOURI

Looking Ahead with LEAR

The new Voyager 125, Stinson's contribution toward America's postwar private flying. 4 place with a cruising speed of 135 mph.

What is America's private plane going to look like? This is Stinson's answer—a sleek, serviceable successor to the rugged, hard-working "Flying Jeep" used by the Army as an observation and ambulance plane.

As with other postwar planes, the radio in this Stinson Voyager is a Lear Radio. For Stinson knows from experience that this is a dependable radio—a radio made for airmen by airmen.

This is what Stinson has to say about Lear Radios:

"In the past years we have been installing a large number of Lear Radios in our Reliant and Voyager planes and have always found them to be satisfactory in every respect."

Lear has been making outstandingly fine radio instruments and direction-finding equipment since 1930. And these instruments have won a reputation for their light weight, sensitivity and complete dependability.

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The U.S.O. hostess recognized wings, and rank, but the face was too young for the silver leaf on his shoulder.

"Heavenly day!... How do you Air Force boys run up so much rank so fast?" she asked.

"You just have to keep on livin', ma'am," said the youthful 8th Air Force Lieutenant Colonel . . . and he wasn't being at all facetious!

SINCE last summer they have been trickling back... with rows of ribbons under their wings, foreign service stripes, and the shoulder patch with the "8" between the spread wings of the Air Forces emblem. Too few of us know either the marking or its meaning.

The 8th Air Force began with the first few Flying Forts sent to England in early 1942... proved that precision bombing by day was practical—and deadly... fought with the R.A.F. 500 miles deep in Fortress Europe despite 40,000 anti-aircraft guns, Focke-Wulfe fighters ... and sickening losses to the original group.

With 1943 came reinforcements; but the Ploesti oilfields cost 54 bombers, the two Schweinfurt raids 96. Before the year's end, 60% of the flying personnel were dead, wounded, listed as missing, prisoners of war. At its peak in Spring 1944, the 8th lost in one fateful week in February 170 bombers, downed 548 German fighters, broke the back of the vaunted Luftwaffe.

In a year of hard, persistent fighting, the 8th battered the German war machine and its industries, shriveled Nazi nerves. When D Day came, American armies never met the full strength of the mighty Wehrmacht, but an enemy weakened by disorganized communications and supply lines.

What most Americans fail to realize is that the 8th Air Force saved the lives of hundreds of thousands of doughboys, shortened the European war by perhaps a year . . . earned more decorations and citations than any other military unit in history, as well as our undying gratitude. Watch for the 8th shoulder patch and honor the men who so proudly wear it!

MANY of the 8th Air Force and other AAF bombing personnel were schooled in twin-engine training planes powered with engines made by Jacobs... a fact of which we are justly proud . . . Jacobs Aircraft Engine Company, Pottstown, Pa.

JACOBS · **Pottstown, Pa.**

Expansion Plan Follows Acquisition Of Aviation Concern by Oil Company

RECENT ACQUISITION of working control of Pacific Airmotive Corp., formerly Airplane Manufacturing and Supply Corp., by Union Oil Co. of California, second largest oil company on the West Coast, has aviation circles watching further developments with close interest as well as speculating on future trends of oil companies into the air industry.

In short order following consummation of the acquisition, Airplane Manufacturing and Supply Corp. returned to the former corporate name of Pacific Airmotive which is well established as the company has been operating since 1928 as an air repair and service organization. AMSCO was incorporated in California in 1939 to acquire the business and assets of Pacific Airmotive, division of Bendix Aviation, Ltd.

Official announcement of a newly established base at Anchorage, Alaska, was another step in the company's expansion program. Last week, to further solidify future expansion plans, Earl Herring, president of Pacific Airmotive and Kinner Motors, Inc., requested stockholders to approve an increase in authorized capital stock from 500,000 to 1,000,000 shares. All of the present 500,000 shares are outstanding as result of the sale to Union.

The affiliation of Union with Pacific Airmotive marks a natural tie-in for the oil company which is definitely interested in the future of air operations and provisions for aerial service units. Operations of the oil company cover California, Oregon, Washington, Arizona, Nevada, Montana, Western Idaho, Hawaiian Islands and Alaska. This territory coincides with the present units of Pacific Airmotive at Burbank, Oakland, Glendale, San Diego, Seattle and Anchorage. In addition, there is a repair station at Kansas City.

Working Capital $34,357,126

The oil company which shows a working capital of $34,357,126 and current assets of $54,724,696, is the only major refining company in California which has not used Government money in expanding its wartime refining facilities. Oil company officials point out that although there is working control of Pacific Airmotive there will be no change in management or operation of Pacific Airmotive. The personnel will remain the same. Harold W. Sanders, treasurer of Union Oil, has joined the board of directors of Pacific Airmotive replacing Ralph Lacoe, a former vice president.

Although no purchase price has been announced, the 126,934 shares of unissued stock sold at $3.27 per share while additional purchases from substantial stockholders within the company, including Earl Herring, president, and Lacoe, were acquired at a lower figure, according to Los Angeles financial circles.

Pacific Airmotive's board in addition to Sanders will include, Herring, president, E. O. Locher, Clinton La Tourrette and B. B. Robinson. The last two are Los Angeles businessmen and Locher is engaged in management of the company.

First indication of Union Oil's renewed interest in aviation came last May with the appointment of Lt. Col. C. C. Carpenter as manager of aviation sales. Colonel Carpenter joined Union after three years with the Air Forces as chief of the Fuel and Lubrication Branch, Air Service Command. He was a member of the Aviation Petroleum Products Allocation Committee for the ASC. Prior to being commissioned, Col. Carpenter was employed on the Pacific Coast by another major oil company as an expert in organization, sales marketing and distribution.

The following table shows the earnings of Pacific Airmotive from 1940 to 1943 for the years ending, Nov. 30:

Year	Net Sales	Fed. Taxes	Net Income	Earnings per share
*1940	$ 833,525	$ 25,528	$ 42,186	0.11
†1941	1,316,705	120,000	76,290	0.20
1942	2,228,190	392,415	‡107,960	0.29
1943	4,858,551	510,600	§165,430	0.44

* Year ended Feb. 28, 1941.
† Nine months ended November 30.
‡ Adjusted to give effect to net renegotiation refund of $10,326, charged to surplus in 1943.
§ Including $42,000 postwar refund and $12,000 debt retirement credit in 1943.

de Havilland Building New Feeder Transport

A new feeder transport to be known as the DH 104 Dove has been given first priority in the civil production program of the de Havilland Aircraft Co., Ltd. of England, and a prototype version now is under construction.

The Dove is an all-metal, twin-engine, low-wing monoplane powered with supercharged Gipsyqueen engines driving new de Havilland three-bladed constant-speed feathering and braking propellers. It will have a quick-retracting tricycle landing gear to permit operation from airports of moderate size. While no data on weight or performance has been released, the new plane is said to embody every modern feature of design from the aerodynamic, passenger and operating viewpoints, and to bear an unmistakable family resemblance to the Mosquito bomber.

de Havilland Dove—Bearing a marked family resemblance to the Mosquito, this 8 to 11 passenger all-metal feeder transport, shown in drawing, has been given first priority on the civil production program of de Havilland Aircraft Co., Ltd. It will be powered by Gipsyqueen engines driving fully reversible props. A prototype is now under construction.

Two Ryan Employes Perfect 'Nomogram'

A new computation chart known as a "nomogram" has been designed by two Ryan Aeronautical employes—Wilson G. Hubbell, chief of the laboratory metallurgical section, and Ross Plumb, inspection supervisor—for use in checking test bars. It is said to be as accurate as the slide rule method, yet within the grasp of employes who cannot use a slide, and has reduced computation time by 95 percent.

The "nomogram" consists of a chart marked off with three double-duty marked scales—two dimensions and the one in the center load. First the cross sectional area of the test bar is determined by locating the width and thickness on the dimension scales, laying a straitedge between these points, and reading directly from the middle scale, where it is intersected. This figure is then located on the first scale and the yield or ultimate load as determined on a tensile testing machine on the second scale. These two points are connected with the straightedge, and where it intersects the third scale, the tensile strength is read off in pounds per square inch.

The present "nomogram" is designed for use with aluminum, but may be extended for use with steel or other metals.

Financial Reports

Globe Nets $392,179

Globe Aircraft Corp., Ft. Worth, Tex., reports net income of $392,179 for 1944, after provision for federal income taxes. Earned surplus, as of Dec. 31, 1944, was $472,667, including allowance of $37,279 for a cash dividend of 10c per share.

Sales of airplanes, parts and assemblies for the year ended Dec. 31, 1944, was $17,746,389, and gross profit on sales, $2,007,323. The company reports a backlog of unfilled orders of the approximate value of $8,000,000, which includes contracts with Curtiss-Wright for C-46 assemblies and with North American Aviation, and Fairchild Aircraft Corp., for C-82 assemblies, and with Lockheed Aircraft Corp.

The company has been designated by Douglas Aircraft Corp., as authorized conversion, overhaul and repair station for Douglas airplanes. In this connection, Globe has entered into formal contracts with American Airlines, Braniff Airways, Aerovias Braniff, Hawaiian Airlines, and A. B. Aerotransport (Swedish) for complete modification, conversion, repair and overhaul of a substantial quantity of airplanes which have been and will be released by the government to those airlines.

Globe's consolidated balance sheet shows total current assets of $2,617,391, including cash, $1,433,008; prime contractors of U. S. government (costs under CPFF contracts), $613,724; claims in process of settlement (U. S. government prime contractors), $228,-048. Other assets include property, plant and equipment, $378,480, and total deferred debit items, $26,813; total assets, $3,162,885. Total current liabilities were listed at $2,-264,626, and total capital and surplus, $898,258.

Solar Stock Changes

Solar Aircraft Co. stockholders have approved an amendment to the articles of incorporation which will reduce the authorized number of Series A preferred shares without par value to 12,842; authorize the issuance of 100,000 shares of 90c cumulative convertible preferred stock of $15 par value; and increase the number of authorized shares of $1 par common stock from 600,000 to 1,-000,000. The amendment will become effective when filed with the Secretary of State of California.

Directors of the company have fixed the conversion ratio at one share of common for each share of 90c cumulative convertible preferred stock converted, and a resolution has been adopted declaring a dividend of 15c per share on the $1 par common stock payable June 15 to stockholders of record May 31 on all shares outstanding on that date.

Convair Declares Dividend

Consolidated Vultee Aircraft Corp., has declared a dividend of 50 cents a share on common stock, payable May 15 to stockholders of record May 4. The regular quarterly dividend on preferred stock payable June 1 to stockholders of record May 15. Stockholders at the annual meeting March 21 approved a purchase and option plan involving a reservation of 125,000 shares of common stock for sale to officers and employes.

Bendix 6-Months' Report

Gross sales volume of Bendix Aviation Corp. for the first six months of its fiscal year ending March 31, 1945, amounted to $363,000,000 as compared with $475,000,000 for the same period of 1944. After price refunds, net sales for the period amounted to $340,000,000 as compared with $468,000,000 for the comparable period of the last fiscal year. The reduction in volume was said to be due in almost equal measure to continuing lower prices on the corporation's products for the armed services, and the decline in demand on the part of the services for products made by certain of the corporation's divisions.

Aircraft Radio Offers Shares

F. Eberstadt & Co. has offered to the public 85,500 shares of Aircraft Radio Corp. common stock at $11 a share. The shares offered represent part of the holdings of certain present stockholders and is not new financing by the company.

Aircraft Radio has no funded debt or preferred stock authorized or outstanding and its total outstanding capitalization consists of 297,000 common shares. In 1944 its net sales were $19,877,710 and net profits $534,121, equivalent to $1.79 a share. Dividends have been paid on the stock every year commencing with 1935, last year's payments being equivalent to 33 cents a share on the shares now outstanding.

Fairchild to Refinance V Loans

Fairchild Engine & Airplane Corp. has offered the public through Smith, Barney & Co. and associates a new issue of 90,000 shares of $2.50 cumulative preferred stock priced at $30 a share. The new issue is designed to reduce temporarily Regulation V borrowings with investor capital and to provide for postwar needs.

Fleet Nets $185,767

Fleet Aircraft, Ltd., Fort Erie, Ont., reports a net profit for the year ending Dec. 31, 1944, of $185,767. Current assets as of that date were $4,383,389, and current liabilities $2,-363,046.

WAL on N. Y. Exchange

Western Air Lines will be listed on the New York Stock Exchange. Previously the stock had been traded on the New York Curb Exchange. The company has 409,954 shares of common stock outstanding.

Amex Nets $16,329

American Export Airlines reports a net income after provision for federal income taxes of $16,329 in 1944. Operations throughout the year 1944 were under a contract with the U. S. Navy which terminated Dec. 31.

Grumman Declares Dividend

Directors of the Grumman Aircraft Engineering Corp. have declared a dividend of 50c a share on common stock, payable May 24. Last year the company paid $1 a share in May and 50c a share in November.

Privileges to Continental Motors

The San Francisco Stock Exchange has been granted permission by the Securities and Exchange Commission to extend unlisted trading privileges to Continental Motors Corp. common stock, $1 par value.

Steak Grilled on Plane

When the Duke of Gloucester's private luxury airliner, the Avro-York transport, "Endeavour," reached Canberra, Australia, from England recently the first thought of the crew was to buy an Australian steak to grill in the model all-electric kitchen of the York. They found it particularly enjoyable after their years of service with the Royal Air Force in England where meat had been at such a premium.

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for finest PERformance!

All Macwhyte aircraft products are made in conformance with A-N specifications.

"Safe-Lock" Terminals

...in eye end, turnbuckle end, stud end, fork end, ball, ball and shank, and many others.

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...custom-built for your work. Cable assembly, standard wire rope, and braided slings.

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...for internal and external bracing. Streamline, square, round.

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in 1 x 19, 7 x 7, and 7 x 19 constructions.

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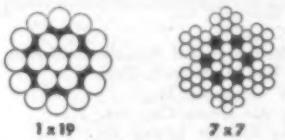
Manufacturers of MACWHYTE "Hi-Fatigue" Aircraft Cables—"Safe-Lock" Cable Terminals—Aircraft Tie-Rods—Braided Wire Rope Slings—and Wire Rope for all requirements.



MACWHYTE
Hi-Fatigue
AIRCRAFT CABLES AND ASSEMBLIES

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DPC Authorizations

DOAK AIRCRAFT CO., providing equipment at its plant in Torrence, Calif., at a cost of approximately $160,000; increase in its contract with Southern Aircraft Corp. providing additional equipment at a plant at Garland, Tex. at a cost of $110,000; overall commitment of approximately $1,250,000.

LUSCOMBE AIRPLANE CORP., West Trenton, N. J., for additional equipment at a West Trenton plant at a cost of approximately $40,000. Overall commitment is now approximately $250,000.

BELL AIRCRAFT CORP. for additional plant facilities at Burlington, Vt., costing approximately $90,000; overall commitment of approximately $2,600,000.

Named WPB Chief of Staff

John Small, executive officer of the War Production Board has been named chief of staff by Chairman J. A. Krug. Small is chairman of the Production Readjustment Committee and the Committee on Period One. Samuel W. Anderson, program vice-chairman has resigned and will be succeeded by Lincoln Gordon, deputy program vice-chairman.

Incorporations

PUBLIC FLYERS, INC., New York, instruction in aviation; Edw. Flander, Elmhurst, N. Y.; $20,000.

RELIANT AIR SERVICE, INC., Fort Wayne, Ind., to build, repair, purchase, sell, and lease airplanes as well as operate plane transportation service and give flying instruction; R. F. Baird, Jr., A. C. Gerwig, and R. Jennings, incorporators; capital structure, 1,000 shares of npv.

A. & D. FLYING SERVICE, INC., Wallingford, Mass.; capital stock, $50,000, divided into 5,000 shares of $10 each; incorporators: Robert Andrews, Roger Descomb, and Robert P. Billings.

CLE ELUM FLYING SERVICE, INC., Cle Elum, Wash.; $5,000; Andrew and Katherine Juris, James and Rhoda Devere to own and operate aircraft and landing field.

WHITE YOUNG AIRCRAFT CO., Fort Wayne, Ind.; 1,000 shares at a par value of $100 a share; Incorporators: Don and Helene M. White, R. M. and G. O. Young; to deal in aircraft and aircraft supplies generally.

BROCKTON AIRWAYS, INC., Brockton, Mass; 1,000 com shares no par value; Nathan A. Trager, president; Joseph Messina, treasure; Dorothy Messina, clerk.

Classified Advertising

PILOTS WANTED By TWA with experience on twin-engined land planes and flying boats to do private flying for corporations and individuals now receiving airplanes for use in their business.

Most of these positions pay a straight salary with travel expenses. There is relatively little flying, and working conditions are pleasant. In applying, give complete experience, civil and military, with time as pilot on each type of equipment, ratings, etc. TWA's interest in this matter is to be of service to pilots looking for employment and to aircraft owners looking for capable, safe, and dependable pilots. Address: R. C. Oberdahn, Transcontinental & Western Air, Inc., 101 West 11th St., Kansas City 6, Mo.

$50.00 will be allowed for any type of old parachute toward the purchase of a new Irvin or Pioneer Parachute. Canopy must be clean. Age and condition of harness immaterial. Joe Crane & Co., 99 Main Street, Mineola, L. I., New York.

PILOT-SALESMAN desires connection with aircraft manufacturer or large corporation in pilot capacity. Over 6,000 hours flight time, single and multi-engined aircraft. Instrument rating. Test work for past three years with large aircraft manufacturer. Sales and organization ability. Thirty-five years old, married. Two years college training. Draft exempt. Box 435, American Aviation, American Building, Washington 4, D. C.

AIRLINE ENGINEER. Graduate aeronautical engineer, B. of A. E. major in Air Transport. Two years experience with major airline as maintenance and operations engineer. Familiar with problems relating to performance, design, and economic studies of present and post-war aircraft. Desires change but wishes to remain in airline industry and continue same type research. Box 434, American Aviation, American Building, Washington 4, D. C.

LEASE. Large modernized hangar building 168' x 200', with adequate office facilities; also modernized steel hangar 100' x 100'; on active and expanding airport within 10 miles distance from Times Square, New York. Ideal for maintenance and repair depot for most type aircraft. Long term lease available to highest type qualified maintenance and repair individuals or company. Possession about January 1, 1946. Write: Bendix Airport, Inc., Manager, Teterboro, New Jersey.

PILOTS needed in Alaska. Here is the inside information on the current flying situation in Alaska. Contents include addresses of airlines and other flying contacts. Get your copy now. Box 455, Flushing, New York.

WATCHES WANTED. Broken or usable, all kinds, even Ingersolls, highest prices paid for jewelry, rings, spectacles, alarm clocks, razors, cigarette lighters, gold teeth, etc. Cash mailed promptly. Lowe's Holland Bldg., St. Louis 1, Mo.

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Assistant Installation Engineer

Age 30-40, graduate aeronautical electrical or mechanical engineer. Field engineering experience desirable; must be personable, with good character; aircraft background helpful. Write qualifications in full.

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Graduate Aeronautical, Electrical or Mechanical Engineer, with 5-6 years experience; and several years experience in sales Engineering work. State education, training in detail. Enclose non-returnable photo.

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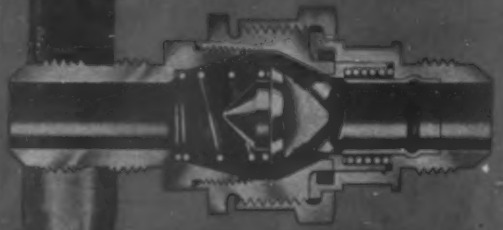
now ready for industry

1. Aeroquip Hose Lines with detachable and reusable fittings simplify the supply problem and save valuable time, thus helping our armed forces on all fronts.

3 PIECES (each replaceable)

Assembly without special tools. No tightening or adjustment after assembly. Fittings can be removed from hose and reused over 100 times.



2. Aeroquip Self Sealing Couplings allow disconnection of liquid carrying lines without loss of fluid and reconnection without inclusion of air.

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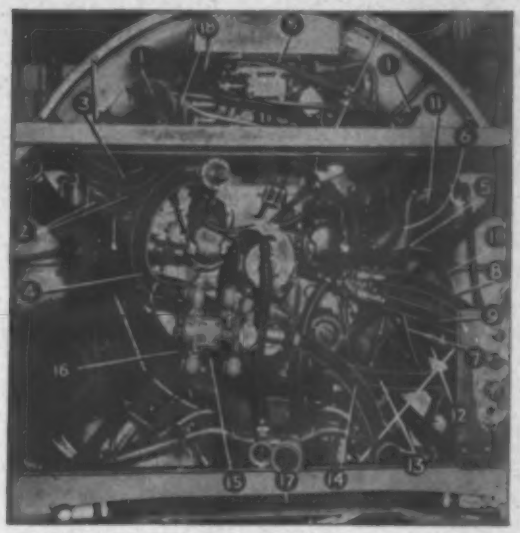
AEROQUIP CORPORATION

JACKSON, MICHIGAN, U. S. A.

5,061 HOURS OPERATION ON NEW BRANIFF INSTALLATION

Engine-change time shortened 30 minutes . . . 40 man-hours saved per overhaul.

With a 5,061-hour operational record revealing new gains in time saved and fire hazards reduced, installation of Aeroquip Flexible Hose Lines in place of rigid power plant plumbing lines on Douglas DC-3's by Braniff Airways marks a forward step in maintenance efficiency.



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2. *Dehydrator*
3. *Prop Feathering*
4. *Oil Suction.*
5. *Carb. De-icer*
6. *Oil Pressure*
7. *Manifold Pressure*
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9. *Hydraulic Pressure*
10. *Fuel Cross Feed*
11. *Fuel Line*
12. *Fuel Suction*
13. *Vac. Suction*
14. *Oil Line to Cooler*
15. *Oil Line Out from Engine*
16. *Oil Line Into Engine*
17. *Oil Line Return to Tank from Cooler*
18. *Primer Line*

Braniff officials report engine-change time reduced by a half-hour, and 40 man-hours saved per engine overhaul, with Aeroquip Hose Assemblies and Self-Sealing Couplings. Further time saving is reported on regular service checks due to cleanliness of power plant sections, absence of leaks minimizing wash-down work.

SAFETY IMPROVED

By elimination of 50% of the pipe joints, and with Aeroquip's leak-proof performance stopping drips in the engine nacelles, fire hazards are measurably cut. Aeroquip's assemblies meet CAA requirements as to sufficient fire resistance. The flexibility also ends problems of rigid lines under vibration.

STOCK SIMPLIFIED

With Aeroquip's quickly removable, reusable and interchangeable fittings, all parts can be replaced individually and new hose lines cut to any lengths and assembled on the spot without special tools. This feature has proved of great value in military use, where these lines are "AN" standard.

WEIGHT SAVED

Aeroquip supplies all these advantages at no sacrifice in weight; in fact, savings totalled 4 lbs. 9 oz. and 4 lbs. 11 oz. for left and right engines.

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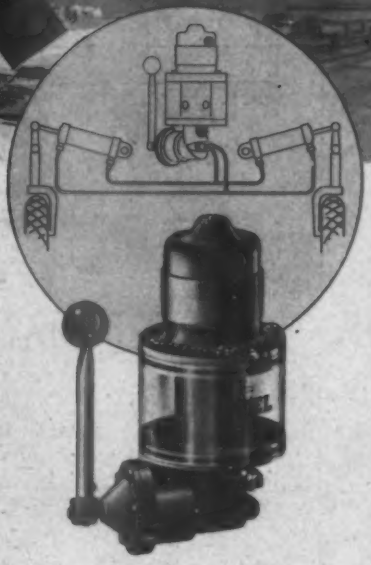
New Power Packages for Light Planes

Designed specifically for the private plane, the new ADEL power package actuates retractable landing gear mechanisms, wing flaps and similar mechanical devices.

A compact unit, easily mounted in small space near the pilot, its electrically driven pump delivers fluid under 300 psi pressure at the rate of .40 gpm with a power requirement of only 298 watts at 12 volts. Its energy capacity is considerably in excess of normal needs of the private plane. Simple to install, it is low in cost and requires a minimum of maintenance for long, trouble-free service.

In this Power Package, ADEL brings to private flying the experience and skill gained in years of manufacturing hydraulic equipment for nearly every leading military and transport plane —tens of thousands of units which have been service tested under every conceivable condition in all parts of the globe.

For full information and technical data write the ADEL office nearest to you.



ABOVE—One of a series of ADEL Power Packages. It comprises an electric gear type fluid pump, visual reservoir, adjustable pressure relief valve, thermal relief valve, a cylinder by-pass valve, 4-way selector valve connected to manual control. Only 4 fittings required to connect. Overall size 4" diameter, 9 3/16" high. Weight filled 4.875 lbs, empty 4.5 lbs.

LOOK TO ADEL FOR PRODUCTS OF *Design Simplicity* AND *Dependability*

ADEL

Trade Mark

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